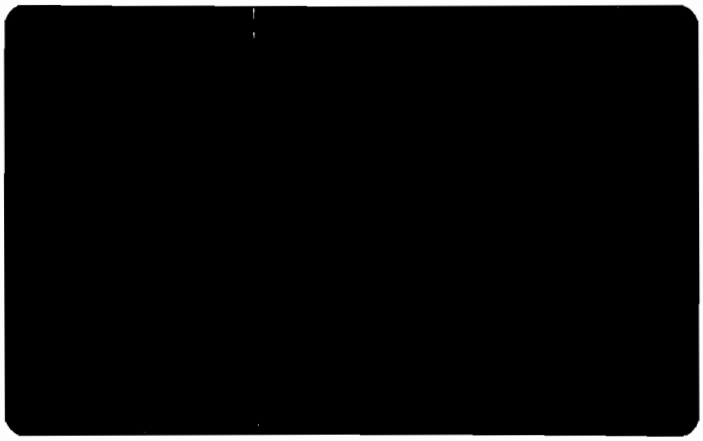
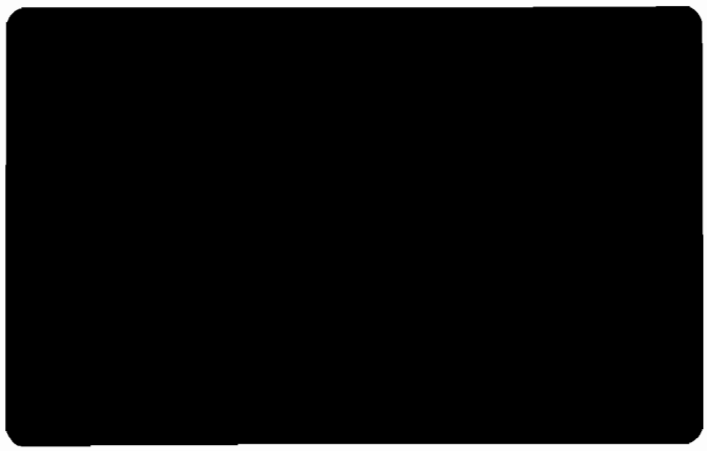


T E S III

TECHNICAL ENFORCEMENT SUPPORT AT HAZARDOUS WASTE SITES

U.S. EPA CONTRACT NO. 68-01-7331

CDM Federal Programs Corporation



CDM Federal Programs Corporation

June 28, 1989

Rose Harvell
Project Officer
U.S. Environmental Protection Agency
401 M Street, Room 2834
Washington, D.C. 20460

PROJECT: EPA CONTRACT NO.: 68-01-7331

DOCUMENT NO.: T336-R03-EP-DJWZ-1

SUBJECT: Final Report for Work Assignment 336
RCRA Facility Assessment for
NGK Metals Corporation
T336-R03-FR-DJXA-1

Dear Ms. Harvell:

Please find enclosed the Final RCRA Facility Assessment for NGK Metals Corporation, as partial fulfillment of the reporting requirements for this work assignment.

If you have any comments regarding this submittal, please contact James L. Hewitt of Geoscience Consultants, Ltd. at (301) 587-2088 within two weeks of the date of this letter.

Sincerely,

CDM Federal Programs Corporation

Bruce R. Pluta
TES III Regional Manager

BRP/dmh

Enclosure

cc: ~~D.~~ Jeff Barnett, EPA Regional and Primary Contact, RCRA Region III
Michael P. Riley, TES III Contracting Officer (letter only)
Donald Senovich, CDM Federal Programs Corporation Program Manager
James L. Hewitt, Geoscience Consultants, Ltd. (letter only)

FINAL RCRA FACILITY ASSESSMENT REPORT
NGK METALS CORPORATION

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	336
EPA Region	:	III
Site/Facility I.D. No.	:	PAD044540136
Contract No.	:	68-01-7331
CDM Federal Programs Corporation Document No.	:	T336-R03-FR-DJXA-1
Prepared By	:	Geoscience Consultants, Ltd.
Work Assignment Project Manager	:	James L. Hewitt
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Telephone Number	:	(215) 597-6688
Date Prepared	:	June 28, 1989

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1.0 INTRODUCTION

1.1 OBJECTIVES

Under USEPA Contract 68-01-7331, Geoscience Consultants, Ltd. (GCL) was contracted to conduct an RCRA Facility Assessment (RFA) for the NGK Metals Corporation facility in Reading, Pennsylvania. This RFA consists of a Preliminary Review (PR) of regulatory and corporate documents, a Visual Site Inspection (VSI) of the facility. A Sampling Visit (SV) has been recommended to determine the present or past occurrence of hazardous waste releases to specific environmental media.

A RCRA Facility Assessment (RFA) is designed to identify and evaluate Solid Waste Management Units (SWMUs) and other areas of concern for potential release of hazardous constituents to the environment. This review is being conducted under the Hazardous and Solid Waste Amendments of 1984 (HSWA), which require comprehensive corrective actions for all releases at interim status facilities and new and existing facilities that received operating or post-closure permits. The purpose and principal-focus is to identify and address unregulated releases of hazardous wastes and/or constituents to air, surface water, soil, subsurface gas, and ground water.

The first section of this RFA report for NGK Metals Corporation (Section 1.0) presents a discussion of the objectives of the RFA, site location, owner/operator and permit history, and background information including the geology, hydrogeology, demographics, local water supply, and meteorological conditions. Sections 2.0 and 3.0 of this report focus upon the results of the PR and VSI, respectively. The conclusions necessary for further actions are presented in Section 4.0 of this Draft RFA document.

1.2 SITE LOCATION AND OWNER/OPERATOR HISTORY

The NGK Metals Corporation (formerly Cabot Berylco Division of Cabot Corporation) facility is located on Tuckerton Road in Muhlenberg Township, Berks County, Pennsylvania (Figure 1-1). This site is bordered on the north, east, and south by Tuckerton Road, Conrail railroad tracks,

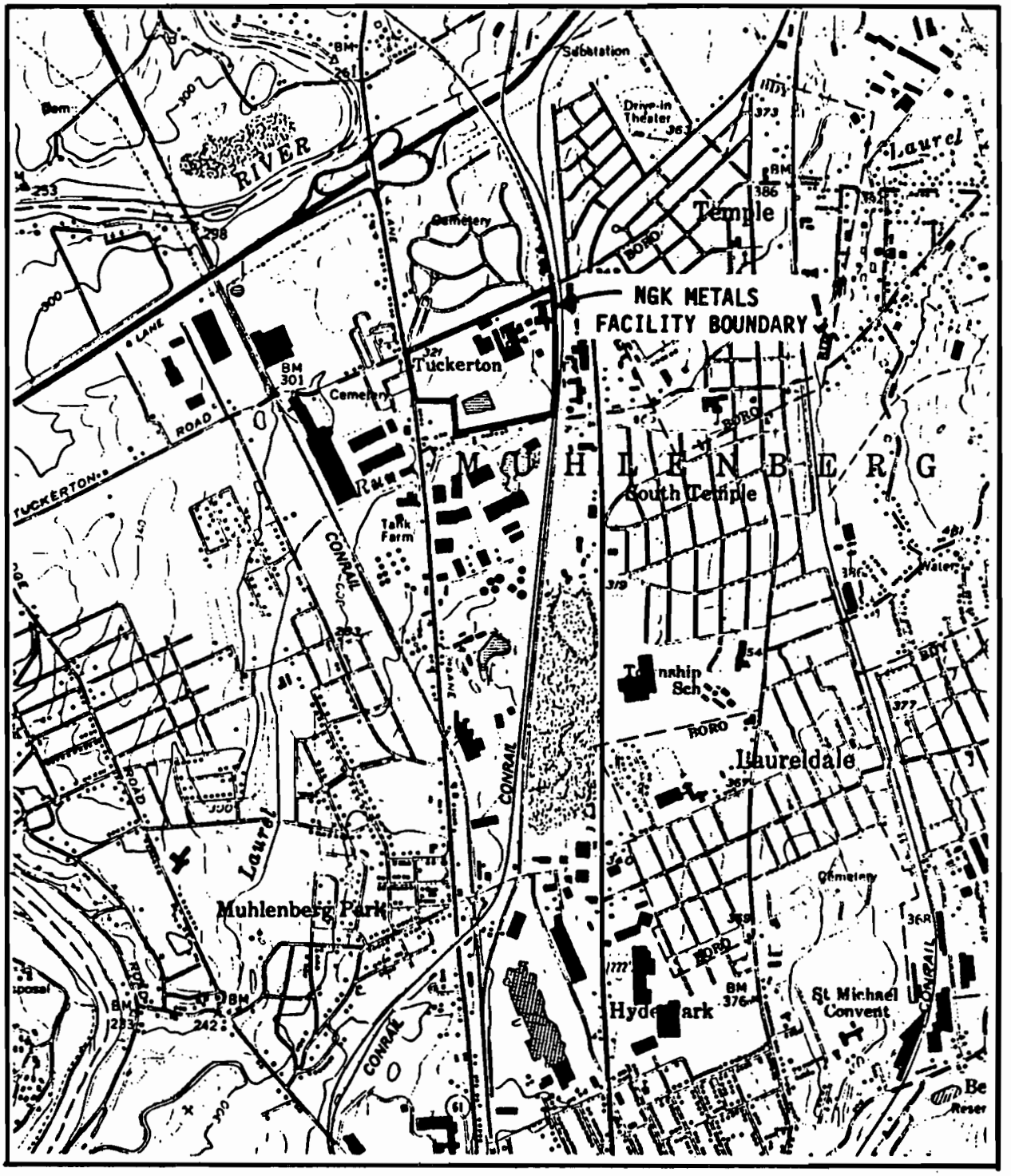

FIGURE 1-1

NGK METALS FACILITY LOCATION MAP, READING, PENNSYLVANIA

From USGS Temple, Pa 7.5 Quadrangle

and Water Street, respectively, and on the west by industrial properties along Pottsville Road.

The area surrounding this facility is both urban and industrial. Urban properties are located immediately adjacent to the northern and southern boundaries of this facility. Industrial properties are located immediately adjacent to the eastern and western boundaries.

NGK Metals Corporation produces alloys containing beryllium and nickel for specialized applications. Manufacturing processes at this site include several operations which produce both hazardous and non-hazardous industrial wastes. A detailed description of this facility's operations is beyond the scope of this report. However, a detailed description of SWMUs associated with this facility's operations is provided in addition to waste characteristics associated with each SWMU. At present, this facility generates and treats hazardous wastes. Although this facility once stored and disposed of hazardous waste on site, these practices have since been abandoned.

The owner/operator history for the NGK Metals Corporation facility is relatively complex, involving several owner/operator changes during this facility's operational life from 1935 to present. The owner/operator history of this facility, in addition to its permit history, is summarized in Table 1-1.

1.3 BACKGROUND INFORMATION

1.3.1 Geology

A geologic map of the NGK Metals facility and surrounding area is provided in Figure 1-2. The bedrock geology within and immediately adjacent to this site consists of the Cambrian-age Allentown Formation. The Allentown Formation consists of fine-to medium-grained gray dolomite and interbedded limestone (Appendix A, Page 1). This facility is located on the southeast limb of a northeast-southwest striking recumbent anticline which has been faulted.

The Tuckerton fault, an east-west trending normal fault, occurs within the northern portion of this facility (Figure 1-2). Displacement on the fault varies from less than 2,000 to over 3,000 feet (Appendix A, Page 1).

TABLE 1-1

SUMMARY OF NGK METALS CORPORATION FACILITY'S OWNER/OPERATOR AND PERMIT HISTORY, READING, PENNSYLVANIA

DATE	ACTIVITIES
November, 1935	Beryllium Corporation became established at Reading, Pennsylvania site.
October, 1968	Beryllium Corporation merged with Kawecki Chemical Company to form Kawecki Berylco Industries.
1978	Kawecki Berylco Industries purchased by Cabot Corporation. Facility operated as Cabot Wrought division then Cabot Berylco Division of Cabot Corporation.
November, 1980	Cabot Berylco Division submitted RCRA Part A Application to EPA.
April, 1983	Cabot Berylco Division submitted RCRA Part B Application to PADER.
May, 1986	Cabot Berylco Division Closure Plan submitted for hazardous waste container storage area and landfill. This plan was submitted in order to withdraw the Part B Application for a hazardous waste permit.
June, 1986	Cabot Berylco Division certified closure of spent acid storage tanks.
September, 1986	NGK Insulators, Limited, Division of Nagoya Corporation, purchased Cabot Berylco Division from Cabot Corporation and formed NGK Metals Corporation.
January, 1987	Facility under RCRA Part B permit status.

Sources: Appendix A, Pages 1 and 3

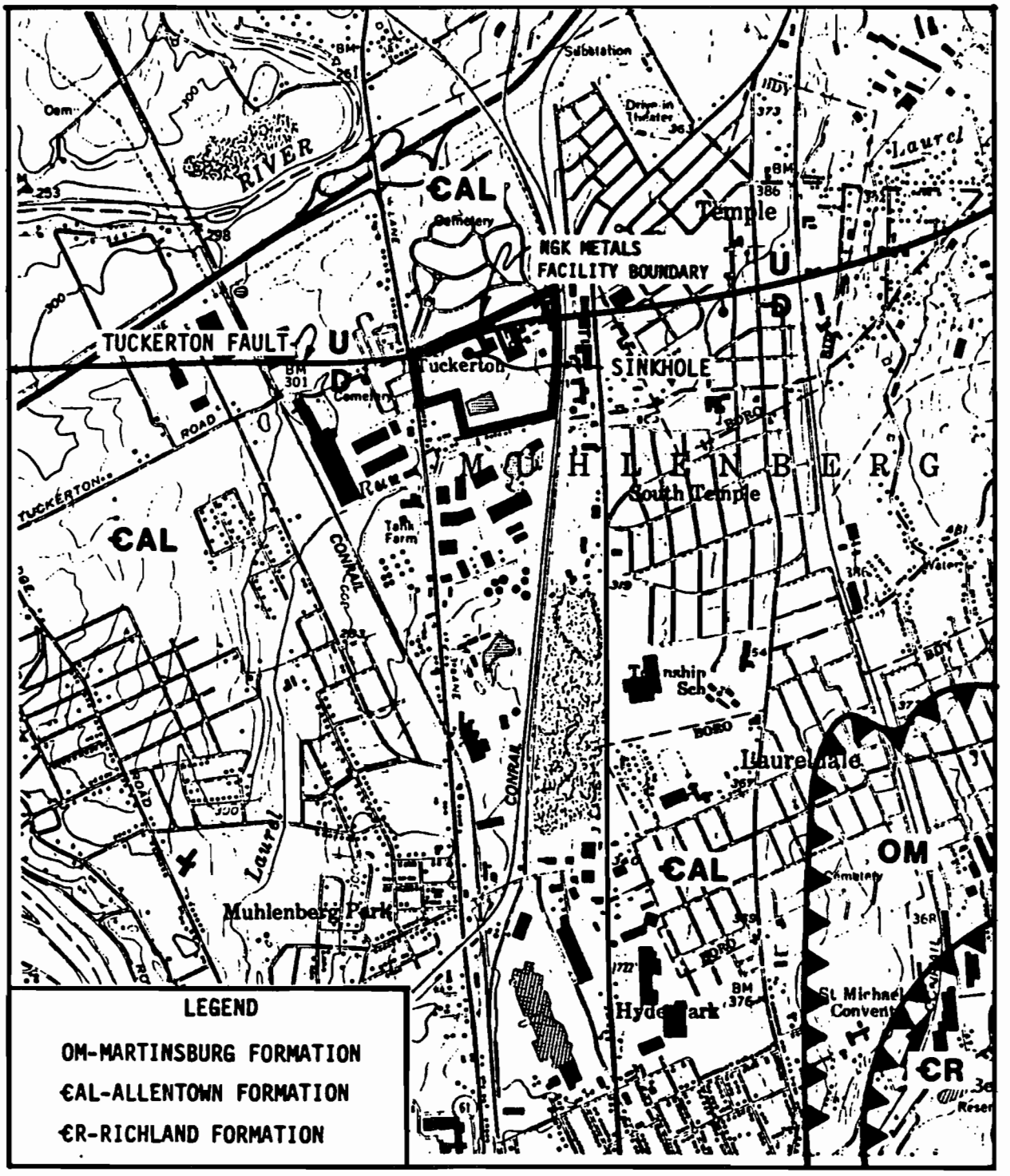

FIGURE 1-2

GEOLOGIC MAP OF THE NGK METALS FACILITY
AND SURROUNDING AREA, READING, PENNSYLVANIA
(Modified from Geologic Map in Appendix A-1)

A sinkhole, developed within the Allentown Formation, occurs in the north-central portion of this facility, south of the Tuckerton fault (Figure 1-2).

Weathering of the Allentown Formation bedrock surface varies from deep in the northern portion of this facility to relatively shallow in the south (Appendix A, Page 1). The average depth to bedrock is 38 feet below the land surface.

A soils map of the NGK Metals facility and surrounding area is provided in Figure 1-3. Surficial soils occurring within and immediately adjacent to this site consist of the Duffield Series (Duffield silty loam) and Made Land (fill material). Underlying surficial soils are unconsolidated sediments which consist of brown to yellow-brown silty clay with varying amounts of pebbles, gravel, cobbles, and decomposed bedrock fragments. The thickness of these soils and unconsolidated sediments have been logged in the area immediately adjacent to the Existing Landfill. From the available test boring logs, (see Appendix C) the soils and unconsolidated sediments in that specific area of the NGK Site vary from 16 to 67 feet. In general, soil and sediment occurring within this facility is well-drained (Appendix A, Page 1).

1.3.2 Hydrogeology

Determining the direction of surface water drainage, ground water flow direction, and aquifer characteristics is of critical importance in defining potential contaminant migration pathways and in determining exposure potentials. The direction of surface water drainage is provided in Figure 1-4. This diagram shows that, for most of the facility, water drains to the south and discharges into Water Street. Surface water discharging into Water Street is diverted into Laurel Run which is located immediately south of this street. Laurel Run flows south-southwest for approximately two miles before discharging into the Schuylkill River. Surface water within the northeastern portion of this facility is collected by drainage systems which transfer this water to the waste treatment facility (Appendix A, Page 1).

The uppermost aquifer occurring at the facility is in the unconsolidated sediments in the Allentown Formation. Ground water flow within this aquifer is

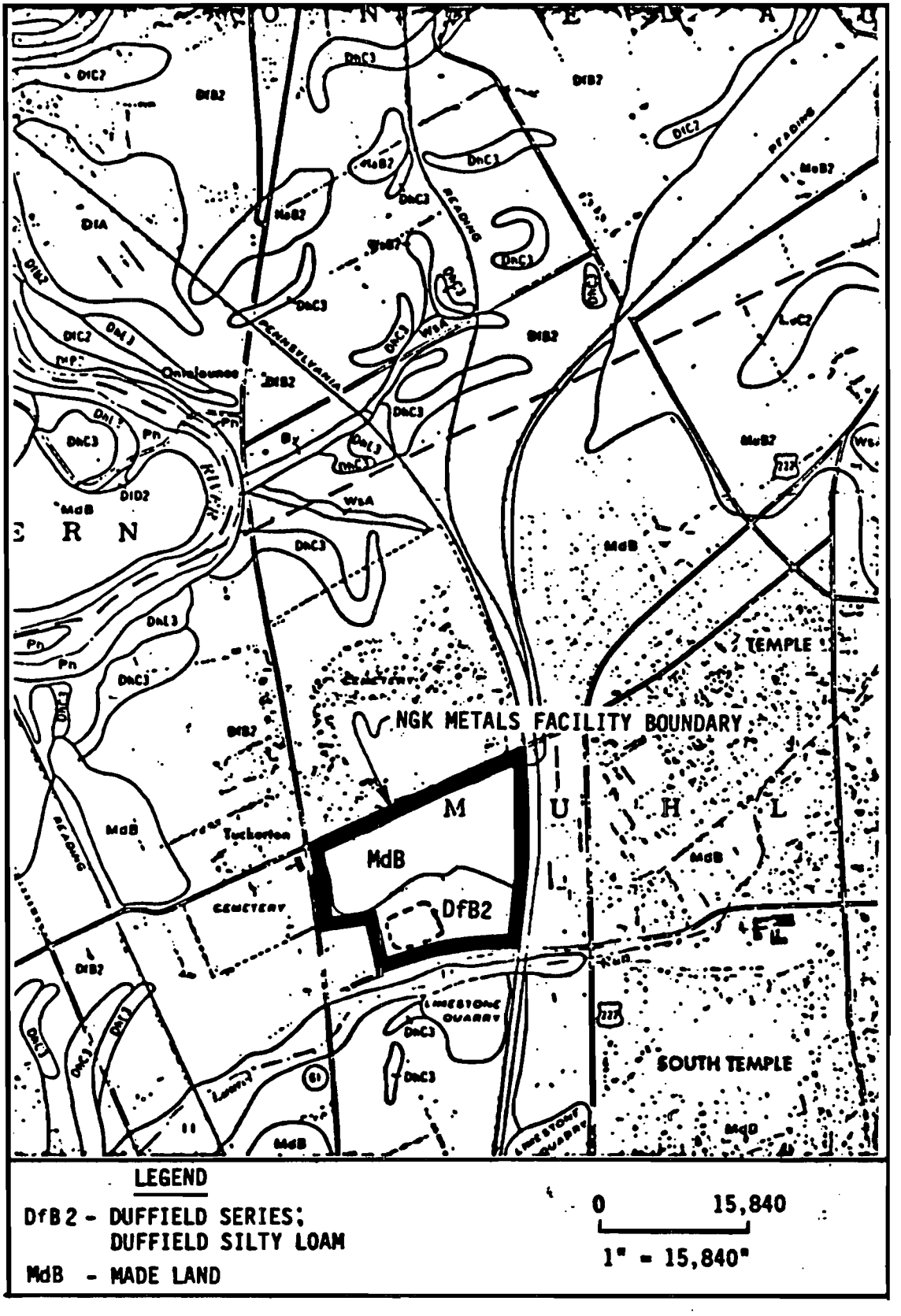

FIGURE 1-3

SOILS MAP OF THE NGK METALS FACILITY AND SURROUNDING AREA, READING, PENNSYLVANIA.
(Modified from Soils Map in Appendix A-1)

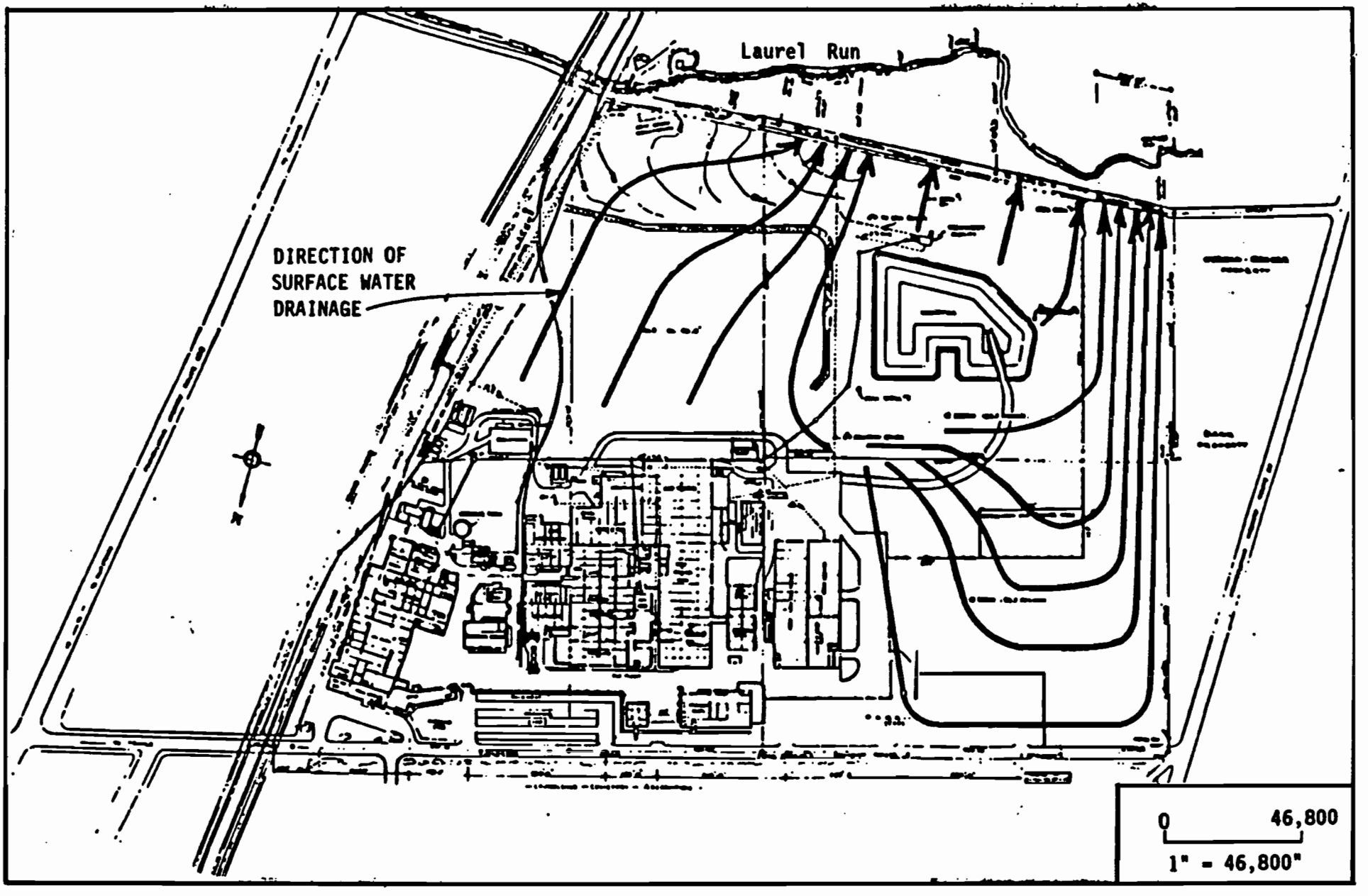

FIGURE 1-4

SURFACE WATER DRAINAGE MAP OF THE NGK METALS FACILITY, READING, PENNSYLVANIA.
(Modified from Surface Water Drainage Map in Appendix A-1)

locally controlled by the intergranular porosity of the unconsolidated sediments and the secondary porosity of the Allentown Formation.

Secondary porosity of the Allentown Formation exists along fault, fracture, and joint planes, and along solution channels which are usually concentrated along these planes. Therefore, the Tuckerton fault and sinkhole located within the northern portion of the NGK facility can possibly act as preferred migration pathways for contaminant migration within this aquifer.

A total of four monitor wells are located within the southwestern portion of this facility (Plate 1-1). Monitor wells 001 and 003 were constructed in 1979, and well 002 was completed in 1980 (Appendix A, Page 1). Monitor well 004, according to the available recorded ground water analytical data, was constructed in late 1981. A summary of well completion data for each of the four monitor wells is provided in Table 1-2. This well completion data indicates that the monitor wells' screened intervals occur within the Allentown Formation and unconsolidated sediments. Water level measurements from these four wells indicate that ground water within this facility flows towards the southwest (Plate 1-1). The uppermost aquifer, within the unconfined (watertable) aquifer, ranges in depth from grade elevation from 17 to 48 feet (see Table 1-2) and has less than 3.5 feet of seasonal water table fluctuation (Appendix A, Page 1). The gradient of the water table is currently unknown; this information was not included in this facility's Part B Application. The nearest ground water discharge area for this uppermost aquifer is Laurel Run, which is located south of the southern boundary of this facility (Plate 1-1). The rate of ground water flow at this site is currently unknown; pump tests of the four monitor wells present have not been conducted to date.

1.3.3 Demographics and Local Water Supply

According to the U.S. Bureau of the Census (Appendix A, Page 7), the population of Muhlenberg Township decreased by 662, from 13,693 to 13,031 people in 1980. Berks County Planning Commission's population projections (Appendix A, Page 7) for Muhlenberg Township are 13,863 and 14,888 persons for the years 1990 and 2000, respectively. The Boroughs of Temple and Laureldale, which are located within Muhlenberg Township, are located to the east and southeast of this

TABLE 1-2

SUMMARY OF MONITOR WELL COMPLETION DATA,
NGK METALS CORPORATION, READING, PENNSYLVANIA

MONITOR WELL NO.	WELL GRADE ELEVATION*	DEPTH TO WATER TABLE FROM GRADE ELEVATION	PUMP DEPTH **	SCREENED INTERVAL **	LITHOLOGIC DESCRIPTION**
001	293.3	17	38	17-50	0-35 gravel 35-50 broken limestone
002	308.1	27	53	27-53.5	0-20 clay 20-52 brown sandstone 52-53 limestone
003	292.5	25	50	25-56	0-40 stones and clay 40-55 gravel
004	300.45	48	62	48-75	0-4 fill 4-55 clay and gravel 55-65 boulders and clay 65-70 limestone 70-75 clay and boulder

* Elevation in feet above mean sea level
** Depths in feet below grade elevation

Adapted from Appendix A, Page 4

facility, respectively. The populations of the boroughs of Temple and Laureldale in 1980 was 1,486 and 4,047 persons, respectively, according to the U.S. Bureau of the Census (Appendix A, Page 7).

The Muhlenberg Township Authority and Reading Bureau of Water supply most of the public water for domestic and industrial uses within a two mile radius of the NGK Metals facility (Appendix A, Page 5). However, there are several privately owned water wells that are also used as water supply sources. The locations of these privately owned water wells within a two mile radius of the NGK Metals facility are provided in Figure 1-5.

1.3.4 Meteorological Conditions

The climate of this region is classified by the U.S. Weather Bureau as comparatively mild with warm, humid summers and mild winter weather (Appendix A, Page 6). Variations in winter climate of Berks County are due mainly to the differences in elevation. More snow and lower average temperatures are found in the higher elevations of Berks County than the lower elevations of the southern part of the County. Although the precipitation is well distributed throughout the year, showers and thunderstorms produce the heavier amounts of precipitation during the summer months. Winter snows are scant in accumulation and short in duration, leaving the ground relatively bare during most of the winter. A summary of meteorolgocial data for Berks County, Pennsylvania is provided in Table 1-3.

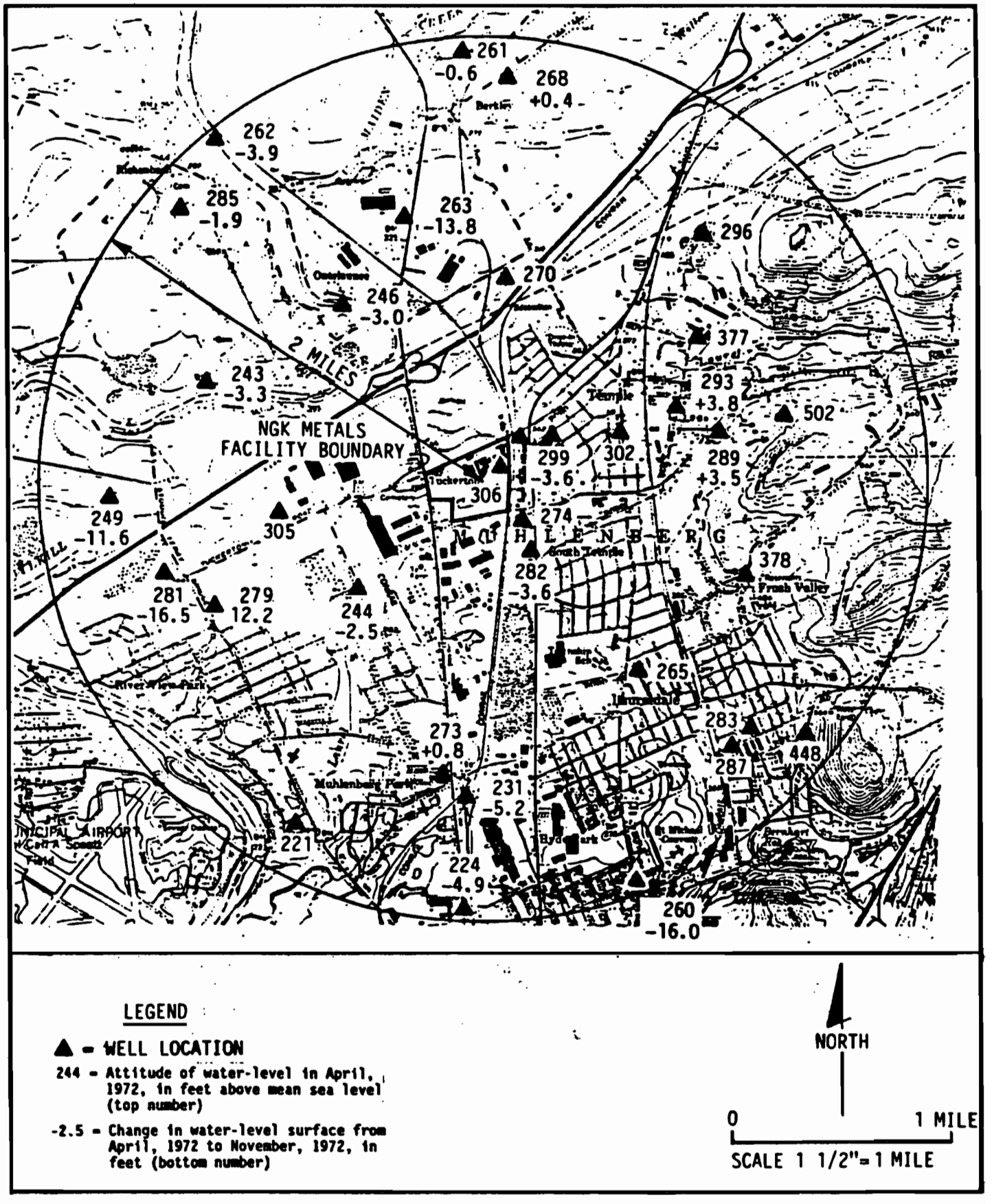

FIGURE 1-5

MAP SHOWING THE LOCATION OF PRIVATELY OWNED WATER WELLS
WITHIN A TWO MILE RADIUS OF THE NGK METALS FACILITY, READING PENNSYLVANIA

TABLE 1-3

SUMMARY OF METEOROLOGICAL DATA FOR BERKS COUNTY, PENNSYLVANIA

	Normal
Elevation (ground, in feet above mean sea level)	266.0
Temperature (degrees F.) -	
Average Daily Maximum	62.9
Average Daily Minimum	45.7
Monthly Average	54.3
Degree Days - Ten Year Average	5,701
Total Precipitation (inches)	41.43
Total Snow, Sleet (inches)	29.7
Relative Humidity - % (7 A.M., E.S.T.)	75
Wind (m.p.h.)	
Mean Hourly Speed	10.5

Source: Appendix A, Page 6

2.0 PRELIMINARY REVIEW (PR)

2.1 OBJECTIVES OF THE PRELIMINARY REVIEW (PR)

The two primary objectives of this PR are:

- To evaluate existing information on the facility's SWMUs in order to identify and characterize potential releases; and
- To identify the activities to be conducted during the second step of the RFA, the Visual Site Inspection (VSI), and recommend (if necessary) the Sampling Visit (SV).

The scope of the PR includes investigating release potential to all environmental media at the facility including air, surface water, soil, subsurface gas, and ground water. This PR document includes the information sources evaluated, describes potential releases of concern at the facility, and provides recommendations that will focus subsequent activities.

2.2 RESULTS OF THE PR

A total of four Solid Waste Management Units (SWMUs) were identified during the PR phase of the RCRA Facility Assessment (RFA). Each SWMU is located, characterized, and evaluated for actual and/or potential releases in the following sections. These SWMUs are identified on Plate 1-1 with a number (e.g. 2.2.1) which corresponds to the section of this review in which that unit was discussed.

2.2.1 Spent Acid Storage Tanks

The Spent Acid Storage Tanks SWMU is located within the northeastern portion of this facility (Plate 1-1). This SWMU consists of three vertical cylindrical, above-ground, 8,500 gallon capacity storage tanks. These tanks are located on a curbed concrete pad adjacent to a crushed-limestone, tanker-truck loading pad. The concrete pad and crushed limestone bed are sloped to drain to a collection sump which is connected to the waste treatment facility. The treatment facility can be by-passed to an emergency storage tank (Appendix A, Page 1). At present, these tanks temporarily store (for less than 90 days) spent sulfuric acid (EPA hazardous waste no. D-002 and D-007) in the southernmost tank, spent nitric acid (EPA hazardous waste no. D-002 and D-007) in the middle tank, and mixed acid and chromium rinses (EPA hazardous waste no. D007)

in the northernmost tank. These tanks have been operating satisfactorily since their installment in 1967 (Appendix A, Page 1). These tanks are also inspected daily. The spent acids are pumped to tanker trucks and hauled off-site for treatment on a periodic basis.

Each spent acid storage tank is totally enclosed, isolating the wastes from the air. Therefore, air was and is not a viable pollutant migration pathway. The concrete pad, drain, and collection sump would effectively collect any acids resulting from major spills. Therefore, releases to surface water, soil, subsurface gas, and ground water are unlikely to occur, and no evidence was found during the PR to suggest a release to these media had occurred.

2.2.2 Waste Treatment Facility

The Waste Treatment Facility SWMU is located within the northeastern portion of this facility (Plate 1-1). This SWMU was constructed in 1951 and modified in 1967 (Appendix A, Page 1). Modifications made after 1967 to address the facility's Pollution Incident Prevention Plan were designed by Plant Engineering. This facility is permitted under the National Pollutant Discharge Elimination System (NPDES Permit No. PA 0011363) and, according to NGK, consistently meets the effluent discharge requirements under that permit (Appendix A, Page 1).

The waste treatment facility presently consists of an underground, concrete and resin-lined, lime neutralization tank, an above ground, reinforced concrete emergency storage tank, and the relatively new, above ground, reinforced concrete, sludge settling tank. Based on the physical and chemical nature of waste treated at this SWMU, releases to air probably did not occur and air is not a possible pollutant migration pathway. In addition, no evidence was found during the PR which suggest a release to surface water, soil, subsurface gas, and ground water had occurred from the present waste treatment facility.

This SWMU utilizes a chemical treatment process with a 245,000 gallons per day design flow. This SWMU operates on a continuous basis while chemical cleaning operations are conducted at the plant. The process train includes equalization, chromate reduction with sulfur dioxide (not presently operating), lime neutralization, clarification (primary and secondary settling), and discharge.

Alkaline sludge (EPA hazardous waste no. D-007) from the clarifier process is stored and dewatered. Approximately 1,250 tons of this sludge is produced each year from this SWMU. The dewatered sludge is hauled off by licensed haulers, and disposed of off-site at licensed treatment and disposal facilities. This facility also includes an alarm system and a 70,000 gallon emergency holding tank for use should the treatment system malfunction (Appendix A, Page 1).

Sludge settling tanks located along the east-central boundary of this facility (see Plate 1-1) structurally failed in 1984 and were closed in 1984. Detailed documentation of this incident was not available during the PR. GCL has requested that NGK Metals submit facility documentation of this incident in order to access whether this former SWMU had possibly released hazardous constituents to environmental media. NGK Metals responded that their facility has limited documentation on this incident. NGK suggested contacting appropriate personnel at the Pennsylvania Department of Environmental Resources (PADER) for additional information concerning this incident. As a result of the closing of these sludge settling tanks, a new sludge settling tank was installed immediately south of the emergency storage tank.

2.2.3 Existing Landfill

The Existing Landfill SWMU is located within the southwestern portion of this facility (Plate 1-1). The landfill is approximately 300 by 380 feet in area and 20 feet deep. It has a total capacity of approximately 30,000 (55 gallon) drums. A description of the solid waste being disposed of in the landfill is provided in Table 2-1.

This landfill is a double-lined facility that includes a leachate collection and treatment facility (Plate 1-1). According to this facility's Part B Application (Appendix A, Page 1), the landfill is constructed with:

- An impermeable 0.25 inch thick asphalt liner to prevent migration of contaminants into the ground water;

TABLE 2-1

DESCRIPTION OF SOLID WASTE DISPOSED OF IN THE EXISTING LANDFILL, NGK METALS CORPORATION, READING, PENNSYLVANIA

(From Table I-1 in Appendix A, Page 1)

Source	Physical Description	Chemical Description	Est. Quantity Tons per Month	Est. Quantity Cubic Yards per Month
Routine Wastes				
(1) From Maintenance Work	Furnace refractories; ladle liners; worn DC bags absolute filters, bulky and irregular shapes. Packaged in steel or fiber drums.	Carbon; iron scrap;beryllium, copper	8	5
(2) From portable and stationary vacuum cleaners	Floor dirt and dust. Packaged in plastic bags and fiber drums.	Silica, may or may not contain beryllium and copper	2	4
(3) From primary and secondary dust collectors	Precoat material on D.C. bag and particulate emissions from furnaces. Packaged in plastic bags and fiber or steel drums.	Asbestos shorts, solka floc; beryllium oxide; copper oxide, metal carbonates and chlorides	2½	5*
(4) From R&D experimental work	Furnace linings, scrap	Carbon, may or may not contain beryllium and copper	1	1
(5) From Precision Cast Products plant	Furnace linings; ladle liners, precoat material from DC; scrap	Carbon, beryllium, asbestos and solka floc precoat	½	1
Total Routine			14	16
Non-routine				
Accumulated beryllium containing material, from past operations. Some of this material may have reclaimable value.		Contains beryllium and copper	250 total	400 total

*This quantity has increased recently. Efforts are being made to reduce the number of times the dust collector bags have to be cleaned. The projected high value is 27 cubic yards per month.

18 April 1978

- A leachate collection and treatment system to handle liquids from the landfill;

- An underdrain system sandwiched between the liner and a relatively impermeable boundary layer (one foot of compacted clay of 10^{-4} cm/sec permeability) to monitor the integrity of the liner;

- A system of underdrain monitoring points, connected to the piping of the underdrain system, from which it can be determined if and where there is liquid flowing in the system and from which samples can be collected; and

- A ground water interceptor system to detect ground water (should the water table rise to the level of the landfill), which also allows sampling of the ground water. If ground water contamination should occur, this system can possibly be used as part of a contamination recovery process from the area.

A plan view of this SWMU showing the location of the underdrain system, leachate collection system, and ground water interceptor system is provided in Figure 2-1. As indicated in this figure, each of these systems is connected to separate collection wells that are constructed of concrete and contain a submersible pump. Water accumulating in the wells is pumped to the leachate treatment facility located immediately adjacent to the southeast boundary of the landfill. The leachate treatment facility is designed to treat leachate collected from the landfill prior to discharge into the Muhlenburg Township sanitary sewer system (Appendix A, Page 1).

Release of solid waste and/or hazardous constituents to air have probably not occurred from this SWMU because the solid waste is being stored in drums which are sealed and covered by soil. As mentioned in Section 1.3.2 of this report, four monitor wells are located in the immediate vicinity of the landfill. Monitor wells 001, 003, and 004 are hydrologically downgradient from this landfill, and monitor well 002 is upgradient from this landfill. Ground water analytical data from samples from all four wells (see Appendix D), have indicated that since their installation, Primary Drinking Water Standards (PDWS)

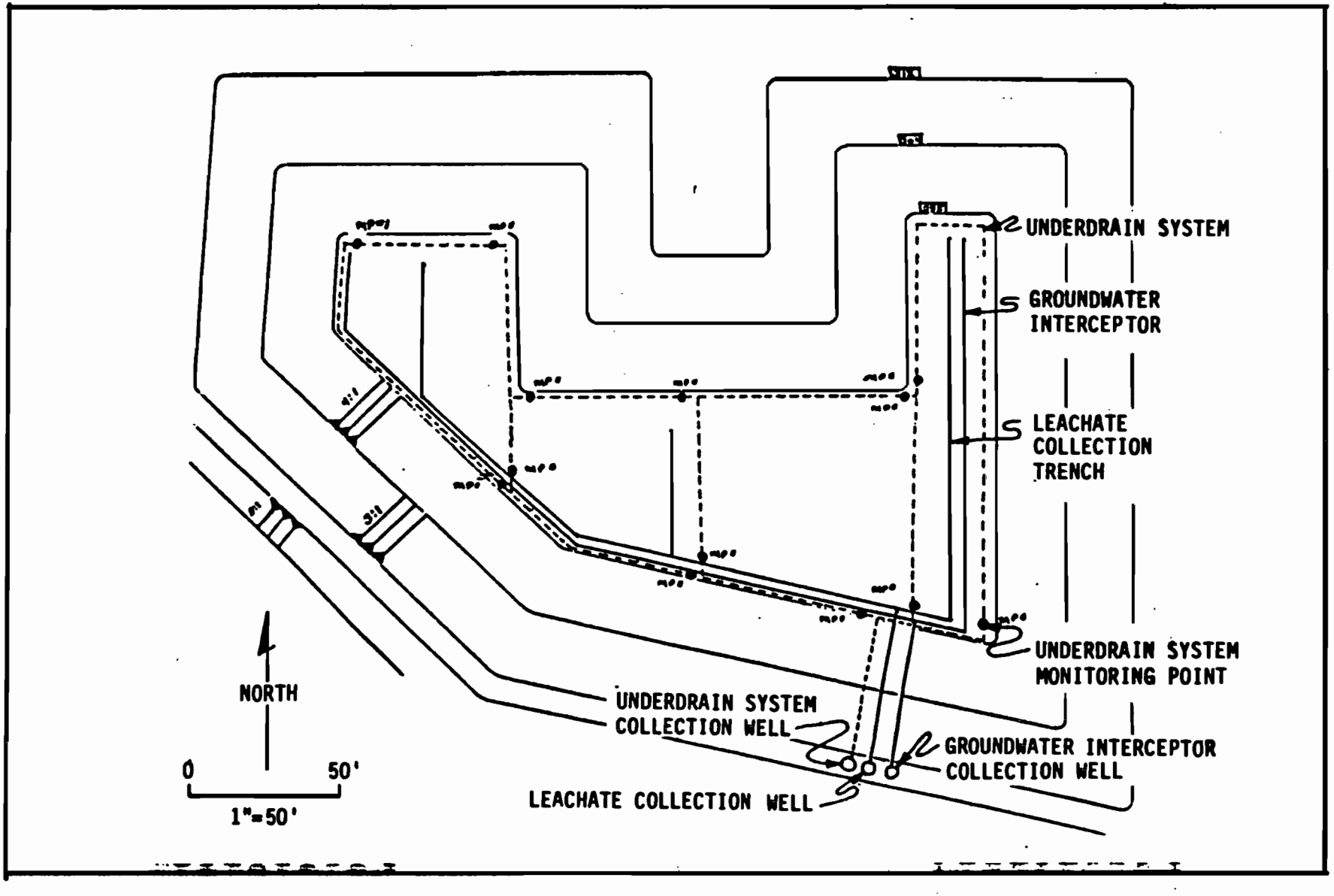

FIGURE 2-1

PLAN VIEW OF EXISTING LANDFILL SHOWING LOCATION OF UNDERDRAIN SYSTEM LEACHATE COLLECTION SYSTEM, AND GROUND WATER INTERCEPTOR SYSTEM

(Modified from Landfill Map in Appendix A-1)

were exceeded for fluoride, chromium, and in some instances, nitrogen (as nitrate). In addition, Secondary Drinking Water Standards (SDWS) were exceeded for Total Dissolved Solids (TDS), sulfate, iron, and in some instances pH and manganese for samples taken from each of these wells.

The relatively high concentrations of fluoride, chromium, and nitrate (as nitrogen) in ground water are a hazard to human health and the environment. The high concentrations of nitrate in ground water on-site are not natural for the area and are derived mostly from crop fertilization, on-lot sewage disposal, and barnyard wastes (Appendix A, Page 5). In a study conducted by PADER (Appendix A, Page 5), the source of fluoride and chromium was attributed to the leakage from ponds within this facility in which soluable industrial wastes were stored. These ponds were not noted in the PR but were discovered during the VSI.

The previously mentioned PADER study (Appendix A, Page 5) indicates that the elevated fluoride and chromium concentrations are also present a considerable distance off-site and downgradient from this facility. It was learned from the PADER study that fluoride and chromium concentrations in the ground water along Laurel Run from South Temple to the Schuylkill River (a distance of approximately two miles) exceed PDWS for fluoride and chromium (Appendix A, Page 5). Therefore, potential human receptors are those who use privately owned water wells along Laurel Run for drinking purposes (see Figure 1-5 for location of off-site wells).

Based on unit and waste characteristics of this SWMU, it is unlikely that this SWMU contributed to documented ground water contamination in the uppermost aquifer in the vicinity of this SWMU. Ground water samples from the upgradient well (well 002, see Plate 1-1) showed similar concentrations of parameters that exceeded PDWS and SDWS. It is therefore possible that the source or sources of these constituents is upgradient from this SWMU. No evidence of release from this SWMU to surface water, soil, and subsurface gas was found in the PR. Sources within the NGK facility, such as the ponds identified as additional SWMUs in the VSI, may have contributed to the contamination of ground water as discussed in Sections 3.2.1 through 3.2.4, and Section 3.2.6 of this report.

2.2.4 Drum Storage Areas

Two drum storage areas were identified during the PR. These include the 1,1,1- trichloroethane (TCA) storage area (see Plate 1-1, SWMU# 2.2.4) and the beryllium-aluminum dross storage area (see Plate 1-1, SWMU# 3.2.7). The location of each of these storage areas is provided in Plate 1-1.

Trichloroethane (EPA hazardous waste no. F-001) is used at this facility for the vapor degreasing of rolled metal stripping. Spent TCA is temporarily stored (less than 90 days) in a building and is repackaged in the original 55 gallon metal drums received from the facility's supplier. The estimated quantity of spent TCA produced by this facility each year is 55 tons. Drums containing spent TCA are stored on pallets with four drums per pallet. The pallets with drums are placed on concrete flooring which is sloped to drain into two trenches, each with a sump pit. In the event of a spill, the spent TCA would be pumped from the sump pit and into a drum. The maximum number of 55 gallon drums stored at any one time is 200 or 11,000 gallons. The spent TCA is periodically hauled off-site and recycled or disposed of at approved facilities (Appendix A, Page 1).

Spent TCA in this storage area is contained in drums. If the drums are properly maintained, they isolate product from the atmosphere and eliminate air as a viable migration pathway. The area in which the TCA drums are stored is lined with concrete and is capable of recovering product should a spill occur. Therefore, surface water, soil, subsurface gas, and ground water are not potential pathways of contaminant migration. No releases to environmental media from this area have been reported.

Beryllium-aluminum dross (EPA hazardous waste no. D-003) is produced during the production of beryllium-aluminum alloy. This waste is temporarily stored (for less than 90 days) outdoors in a designated area immediately west of the metal and cast department (Plate 1-1). The waste is placed in dry 55 gallon drums and the lids are sealed with bolted rim clamps. The drums are also lined with plastic and placed on pallets, with four drums to each pallet. The estimated quantity of this waste produced each year is 15 tons. The area on which the drums are placed is underlain by asphalt and gravel. The maximum number of

drums to be stored on-site is 32. This waste is periodically hauled off-site and disposed of at approved facilities (Appendix A, Page 1).

Since this waste is containerized and sealed, the steel drum and plastic isolate this waste from the atmosphere and eliminate air as a potential migration pathway. This waste will slowly react with water to form ammonia (Appendix A, Page 1). If this waste is properly containerized and sealed then water will not come in contact with the waste. Due to the aforementioned method of storage, surface water, soil, subsurface gas, and ground water are not viable pathways of contaminant migration. No releases from this area have been reported to date.

2.3 SUMMARY OF FINDINGS FROM THE PR

Information obtained on the aforementioned SWMUs during the PR was used to determine if these SWMUs had released hazardous waste or constituents to environmental media and to identify data gaps pertinent to this investigation. No evidence concerning hazardous waste or constituent releases from these SWMUs was found during the PR. Documented ground water contamination is found within the southwestern portion of this facility and along Laurel Run from South Temple to the Schuylkill River (see Appendix A-1). The main data gap identified during the PR is that the source of this ground water contamination is presently unknown. All data strongly indicates that the SWMUs identified during the PR have not contributed to this contamination of ground water, consequently, the possibility of contribution from other upgradient sources within this facility should be fully investigated.

3.0 VISUAL SITE INSPECTION (VSI)

3.1 OBJECTIVES OF THE VISUAL SITE INSPECTION (VSI)

On August 4, 1987, Gregory J. Contaldo of GCL and Greg Koltonuk of EPA conducted a Visual Site Inspection (VSI) of the NGK Metals Corporation facility. The major objectives of the VSI included:

- Visual inspection of the facility for evidence of hazardous waste and/or constituent releases;
- Identification and photographic documentation of all SWMUs and potential areas of concern;
- Obtaining additional facility documents for use in preparation of this RFA report; and
- Development of recommendations for the next course of action for the RFA (Sampling Visit, Interim Measures, RFI, or no further action).

3.2 RESULTS OF VSI

Additional facility documents, obtained during the VSI, and interviews conducted with facility personnel resulted in the identification of seven additional SWMUs. These additional SWMUs were also inspected during the VSI. The results of the inspection of these SWMUs and the four SWMUs identified in the PR is presented in the following sections. Photographic documentation of the VSI is presented in Appendix B. The seven additional SWMUs are discussed first, followed by the four SWMUs identified during the PR.

3.2.1 Red Mud and Lime Sludge Disposal Areas

The Red Mud and Lime Sludge Disposal Area SWMU is located within the southeastern portion of this facility (Plate 1-1). These disposal areas were in operation from the mid 1940's to the mid 1960's when they were closed. Each disposal area consisted of unlined surface impoundments. The material disposed of in the red mud disposal area was gangue material (worthless crushed rock) from beryllium ore processing herein referred to as red mud. The chemistry of the red mud, as determined from analyses conducted by the facility (Appendix A, Page 2), is as follows:

Silicon	24-27.5%
Fluoride	6.5-10.5%
Iron	6.5-9.5%
Sodium	1-3%
Beryllium	0.30-0.75%
Aluminum	6.5-7.5%
Potassium	0.5-1%
Magnesium, Calcium, Copper, Phosphorous - All	0.5%

The chemistry of the lime sludge has not been determined to date. Each of these disposal areas was leveled and capped with soil in the early to mid 1960's (Appendix A, Page 2).

Inspection of this SWMU during the VSI revealed that the ground surface was well vegetated. However, a relatively small area of what appeared to be red mud waste was exposed (Photos B-14 and B-24). Due to the exposed nature of the red mud waste, air and surface water are potential migration pathways. Additional analytical data to characterize the red mud and lime sludge waste are needed in order to determine if these disposal areas are capable of releasing hazardous constituents to air and surface water. These disposal areas are unlined. Therefore, subsurface gas, soil, and ground water are viable migration pathways. Additional analytical data are also needed to determine if releases have occurred to these media. Based on the aforementioned analyses conducted on the red mud waste, it is possible that these disposal areas are contributing to the contamination of ground water in the vicinity of the existing landfill (see Section 2.2.3). The relatively high concentration of fluoride present in samples taken from monitor wells in the vicinity of the landfill indicates that these disposal areas are a possible source.

3.2.2 Pond #1

The Pond #1 SWMU consists of an unlined pond which was used for sludge settling. The present waste treatment facility is partially located in the area of this SWMU (Plate 1-1). Fluoride wastes, spent acids, and acidic rinse waters were reportedly neutralized by a lime treatment process. The sludge from this neutralization was placed into this pond and allowed to settle. This pond was reportedly used from the early 1950's until the early 1960's, then backfilled and capped with soil and gravel (Appendix A, Page 2).

Surface water is not a potential migration pathway because the soil cap isolates the waste contained within this SWMU from surface water runoff. It is uncertain whether the waste disposed within this SWMU is completely neutralized. Acids may react with gases, therefore, air and subsurface gas may be potential migration pathways. Based on the characteristics of the waste contained within this SWMU (primary constituents of concern include chromium, fluoride and sulfate), and the fact that this pond is unlined, soil and ground water would be potential migration pathways if a release occurred, regardless of whether this waste is completely neutralized. Analysis of the wastes disposed of at this SWMU, and of the surrounding soil, are needed to determine possible migration pathways. Based on the presently known characteristics of waste disposed of in this pond, it is possible that hazardous constituents present in ground water in the vicinity of the existing landfill (see Section 2.2.3) originated from this SWMU.

3.2.3 Pond #2

The Pond #2 SWMU consists of a unlined pond which was used to receive the clear overflow from the sludge settling from pond #1. The location of this SWMU is provided in Plate 1-1. This pond was used from the early 1950's until the 1960's. This disposal area was leveled and capped with soil in the early to mid 1960's (Appendix A, Page 2).

Surface water is not a potential migration pathway because the soil cap effectively isolates the waste contained within this SWMU from surface water runoff. Because enough analytical data to characterize the waste disposed of in this SWMU is not available, it cannot be determined whether the wastes have properties by which air, subsurface gas, soil and ground water could create potential migration pathways to human receptors. Analysis of waste disposed of in this SWMU and the surrounding soil are needed to determine possible migration pathways.

3.2.4 Pond #3

The Pond #3 SWMU was used for the collection of storm water runoff from the surrounding area. The location of this SWMU is provided in Plate 1-1. It is believed by NGK that this SWMU was in operation during the same time frame as Pond #1 and Pond #2. This disposal area was leveled and capped with soil in the early to mid 1960's (Appendix A, Page 2).

Surface water is not a potential migration pathway because the soil cap isolates the waste contained within this SWMU from surface water runoff. Lacking analytical data, it cannot be determined whether the wastes could contribute to air, subsurface gas, soil, and ground water contamination. Analysis of wastes disposed of in this SWMU and the surrounding soil are needed to determine if these media are possible migration pathways.

3.2.5 Former Pond #6

The facility originally designated the Red Mud and Lime sludge disposal areas as Pond #4 and Pond #5, respectively. However, since wastes stored in each of these areas is solid in nature, they decided to name them the Red Mud and Lime sludge disposal areas. Therefore, there are no pond numbers 4 and 5.

The Former Pond #6 SWMU was used for disposal of lime sludge that were removed from Pond #1. This SWMU was located at the same location as that of the Existing Landfill (Plate 1-1). When the Existing Landfill was installed in 1981, Pond #6 was dredged and cleaned out. All of the dredged material was placed adjacent to the Existing Landfill in the form of a waste pile (Appendix A, Page 2). Possible migration pathways and releases from this SWMU are considered in the following section.

3.2.6 Pond #6 Waste Pile

The Pond #6 Waste Pile SWMU consists of sludge that originated from Pond #1. The sludge is a by-product of lime treatment of fluoride wastes, spent acids, and acid rinses (Appendix A, Page 2). The Waste Pile consists of light brown to buff colored, well-graded sandy gravel. The sludge material is piled upon soil and reaches a maximum thickness of approximately eight feet. This SWMU

has been in existence since 1981 when Pond #6 was dredged and cleaned out (Appendix A, Page 2).

Waste comprising this SWMU is exposed to the atmosphere. Therefore, air and surface water are potential migration pathways. Sludge comprising the waste pile was placed upon the ground surface which is unlined. Therefore, subsurface gas, soil, and ground water are also potential migration pathways. Analyses characterizing the waste, and the soils immediately adjacent to this SWMU, are needed in order to determine if releases have occurred or are possible.

3.2.7 Drum Storage Areas

Three additional Drum Storage Areas were identified during the VSI. Documentation on these SWMUs was not available during the PR. A drum storage area located northwest of and immediately adjacent to the existing landfill was inspected during the VSI (Plate 1-1). Solid waste, to be disposed of in the existing landfill, is temporarily stored within this SWMU which has been in operation since 1981 (see Photos B-12 and B-13). The solid waste is stored in 55 gallon drums that are placed on pallets, with four drums per pallet. The pallets are placed upon a relatively thin veneer of gravelly basecourse material. A description of the solid waste temporarily stored within this SWMU is provided in Table 2-1. Approximately 14 tons (or 16 cubic yards) of this material is produced by this facility each month (see Appendix A, Page 1).

Based on the nonhazardous nature (according to the facility's Part B Application) and method of waste storage within this SWMU, air, surface water, subsurface gas, soil, and ground water are not potential migration pathways. No evidence of release to these media was found during VSI.

A drum storage area located immediately north of the existing landfill and immediately south of the rolling mill and casting area (Plate 1-1) was inspected during the VSI (see Photo B-14). Scrap material (primarily metals), which consists of beryllium and copper, are temporarily stored within this SWMU. The scrap material is stored in a variety of containers including wooden crates, 55 gallon drums, and cardboard drums of various sizes (see Photo B-14). These containers are set on pallets which are placed upon a relatively thin veneer of gravelly basecourse material. This waste material is nonhazardous (according to the facility's Part B Application). Due to the present

value of beryllium-copper, the facility saves and stores this material with the intention that it can possibly be recycled in the future.

Based on the nonhazardous nature and method of storage of solid waste within the SWMU, air, surface water, subsurface gas, soil, and ground water are not potential migration pathways. No evidence was found during the VSI which suggest a release has occurred to these media.

A third drum storage area, which is located in the same building as that of the 1,1,1-TCA drum storage area (see Plate 1-1, SWMU# 3.2.7), was inspected during the VSI. Solid wastes stored within this SWMU are potentially hazardous and consist of beryllium hydroxide and flue dust containing varying amounts of beryllium (see Photos B-16 and B-19). Solid wastes disposed of in this SWMU are stored in 55 gallon steel drums placed on pallets, with four drums per pallet. The pallets are stacked and placed upon the floor of the building. The building floor consists of a concrete slab of unknown thickness.

Due to the properly containerized nature of solid waste temporarily stored within this SWMU, it is unlikely that air, surface water, subsurface gas, soil, and ground water are potential migration pathways. No evidence was found during the VSI which suggest a release to these media has occurred.

3.2.8 Spent Acid Storage Tanks

The Spent Acid Storage Tank SWMU (discussed in Section 2.2.1), located within the northeastern portion of this facility (Plate 1-1), was observed during the VSI. The concrete pad on which the three 8,500 gallon capacity storage tanks are placed is stained (see Photo B-1). The area of the concrete pad located immediately below the outlet of the spent sulfuric acid storage tank (southernmost tank) was stained to a yellow-brown color. A relatively small area of the concrete pad located immediately below the outlet of the mixed acid and chromium rinse tank (northernmost tank) was stained to a light blue to greenish color. From the location and relative sizes of these stains it is evident that these stains originated from minor leakage occurring at the tanks' outlets.

Each spent acid storage tank is totally enclosed, isolating the wastes from the air. Therefore, air was and is not a viable migration pathway. The concrete pad, drain, and collection sump, as described in Section 2.2.1, would effect-

ively collect any acids resulting from major spills. Therefore, releases to surface water, soil, subsurface gas, and ground water are unlikely to occur, and no evidence was found suggesting a release to these media had occurred.

3.2.9 Waste Treatment Facility

The Water Treatment Facility SWMU (discussed in Section 2.2.2) is located within the northeastern portion of this facility (Plate 1-1). This SWMU was observed during the VSI and consists of a lime neutralization tank (see Photo B-3), emergency storage tank (see Photo B-4), and sludge settling tank. The above ground, reinforced concrete, sludge settling tank is contained within a rectangular concrete berm which is approximately one foot above the gravel veneered ground surface. The ground surface located immediately west of this concrete berm was stained to a yellowish or rusty brown color (see Photo B-2). Due to the localized nature of this staining and its proximity to the sludge settling tank, it appears that this tank has possibly released constituents to the adjacent soil. Therefore, the stained soil within this area should be thoroughly investigated.

3.2.10 Existing Landfill

The Existing Landfill SWMU (discussed in Section 2.2.3) is located within the southwestern portion of this facility (Plate 1-1). This SWMU was observed during the VSI. The eastern portion of this landfill consisted of a graded surface of compacted soil that is used to cover the solid waste stored in drums. The soil consists of whitish to buff colored, silty, and sandy gravel. Numerous potholes were observed on this graded landfill surface (see Photo B-6 and B-7). The origin of the potholes can be attributed to the existence of a considerable amount of void space within the soil fill material and between the soil and solid waste containers.

The western portion of this SWMU consisted of solid waste contained in 55 gallon drums which are placed on pallets, with four drums per pallet, and wood crates which were placed one per pallet (see Photo B-9). The solid waste contained in this area will eventually be filled in, covered with soil, and graded similarly to the eastern portion of this landfill.

The three leachate collection tanks (see Photo B-10) and leachate treatment facility were also observed during the VSI. The three leachate collection

tanks appeared to be in good condition, as no cracks in the concrete were visible. The leachate treatment facility appeared to be in good condition and functioning properly.

Based on unit and waste characteristics of this SWMU, it is unlikely that this specific SWMU contributed to any documented ground water contamination in the uppermost aquifier in the vicinity of this SWMU. The installation of the wells, ground water samples from the upgradient well (well 002, see Plate 1-1) showed similar concentrations of parameters that exceeded PDWS and SDWS. No evidence of release from this SWMU to air, surface water, subsurface gas, and soil was found during the VSI or PR. It is therefore concluded that the source or sources off parameters exceeding PDWS or SDWS is upgradient from this SWMU. The source or sources which possibly contributed to the contamination of ground water include the red mud and lime sludge disposal areas, Pond #1, Pond #2, and Pond #3.

3.2.11 Drum Storage Areas

The two Drum Storage Areas identified during the PR (see Section 2.2.4) were also observed during the VSI. These include the 1,1,1 - trichloroethane (TCA) storage area and the beryllium-aluminum dross storage area.

A total of twelve, 55 gallon metal drums containing spent TCA were present at the time of the VSI (see Photo B-15). The drums were being stored on pallets, with three to four drums per large pallet or with one drum per small pallet. The drums in which the spent TCA is stored, the concrete floor which the pallets are placed, and the drainage trenches within the concrete floor appeared to be in good condition at the time of the VSI. No evidence was found during the VSI which suggest a release has occurred from this SWMU.

The beryllium-aluminum dross storage area (see Photo B-17), located immediately west of the metal and cast department, contained an undetermined number of steel, 55 gallon drums containing beryllium-aluminum dross. The drums were placed on pallets, with four drums to each pallet, and the pallets were stacked. The area on which the drums and pallets are placed is underlain by asphalt and gravel. The drums in which the waste is stored appeared to be in good condition. No evidence was found during the VSI which suggest a release has occurred from this SWMU.

4.0 CONCLUSIONS AND RECOMMENDATIONS

A total of 10 discrete SWMUs were identified and evaluated at the NGK Metals Corporation facility in Reading, Pennsylvania. The following 10 SWMUs were identified and evaluated:

- Spent Acid Storage Tanks
- Waste Treatment Facility
- Existing Landfill
- Drum Storage Areas
- Red Mud and Lime Sludge Disposal Areas
- Pond #1
- Pond #2
- Pond #3
- Former Pond #6
- Pond #6 Waste Pile

4.1 SUMMARY OF DATA GAPS AND CONCLUSIONS

Based on the evaluation performed during and following the PR and VSI activities, the following data gaps and conclusions pertinent to this investigation are identified:

- The source of ground water contamination in the southwestern portion of this facility is still unknown.

- Analyses of samples of the wastes disposed of in the Red Mud and Lime Sludge Disposal Areas, Pond #1, Pond #2, Pond #3, and Pond #6 Waste Pile are necessary in order to characterize the wastes so that a determination of their release potential can be fully assessed.

- Each of the previously waste disposal areas, with the exception of Pond #6 Waste Pile, consisted of unlined surface impoundments; Pond #6 Waste Pile consists of wastes piled upon an unlined ground surface with no berm surrounding the waste. The wastes disposed of in all of these SWMUs are in direct contact with the surrounding soil. Therefore analyses conducted on soil samples immediately adjacent to these SWMUs are needed in order to determine if a release has occurred to soil. This analytical data can also be used to determine if these SWMUs have possibly contributed to documented ground water contamination in the southwestern portion of this facility and/or off-site.

- Analytical data from samples from each of four monitor wells located downgradient from these SWMUs have exceeded PDWS for fluoride, chromium, and in some instances nitrogen (as nitrate). In addition, SDWS were exceeded for Total Dissolved Solids (TDS), sulfate, iron, and in some instances pH and manganese.

- Concentrations of fluoride, chromium, nitrate and sulfates in the ground water along Laurel Run from South Temple to the Schuylkill River pose a hazard to human health and the environment. Potential human receptors are those who use privately owned water wells along Laurel Run for drinking purposes.

- Ground water samples from each of the four monitor wells located within this facility should also be analyzed so that these analytical results can be compared to those previously taken as well as to the analytical results of the wastes and their surrounding soils.

- The surficial soil located immediately west of the concrete berm of the sludge settling tank, which is part of the Waste Treatment facility SWMU, is stained to a yellowish or rusty brown color. Soil samples are needed in this area to determine if a release to soil has occurred from this SWMU.

4.2 RECOMMENDATIONS FOR FURTHER ACTION

GCL's recommendations for further action are based upon the evaluations conducted, as described in this document, and on the data gaps and conclusions presented above. GCL recommends that further action in the form of a sampling program be conducted at the NGK Metals facility in Reading, Pennsylvania. Table 4-1 provides preliminary recommendations for: sampling locations, matrix types, number of samples and depths, and analytical parameters for the sampling program. A detailed sampling plan for such a program is beyond the scope of this draft RFA report, however, these recommendations are intended to be used in preparation of such a sampling plan.

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TABLE 4-1

RECOMMENDED SAMPLE LOCATION, MATRIX TYPES, NUMBER OF SAMPLES, SAMPLE DEPTHS, AND ANALYTICAL PARAMETERS FOR NGK METALS CORPORATION FACILITY, READING, PENNSYLVANIA

SAMPLE LOCATION	MATRIX TYPES	NUMBER OF SAMPLES*	ANALYTICAL PARAMETERS
SE Red Mud Disposal Area	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
SW Red Mud Disposal Area	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Lime Sludge Disposal Area	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Pond #1	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Pond #2	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Pond #3	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Pond #6 Waste Pile	WASTE	5	TM, F, N, S
	SOIL	10	TM, F, N, S
Monitor Well 001	GROUND WATER	1 - Water Table	VOC, TM, IP, F, N, S
Monitor Well 002	GROUND WATER	1 - Water Table	VOC, TM, IP, F, N, S
Monitor Well 003	GROUND WATER	1 - Water Table	VOC, TM, IP, F, N, S
Monitor Well 004	GROUND WATER	1 - Water Table	VOC, TM, IP, F, N, S

TABLE 4-1
(Continued)

RECOMMENDED SAMPLE LOCATION, MATRIX TYPES, NUMBER OF SAMPLES, SAMPLE DEPTHS, AND ANALYTICAL PARAMETERS FOR NGK METALS CORPORATION FACILITY, READING, PENNSYLVANIA

SAMPLE LOCATION	MATRIX TYPES	NUMBER OF SAMPLES*	ANALYTICAL PARAMETERS
Sludge Settling Tank - west of concrete berm	SOIL	3	TM, F, N, S
Laurel Run	SURFACE WATER	3 - one upgradient - two downgradient	VOC, TM, IP, F, N, S
Laurel Run	SEDIMENT	3 - one upgradient - two downgradient	TM, F, N, S

PARAMETER EXPLANATIONS

VOC = VOLATILE ORGANIC COMPOUNDS
TM = TOTAL METALS
IP = INDICATOR PARAMETERS (pH, Specific Conductance, Total Organic Carbon, Total Organic Halogen)
F = FLUORIDE
N = NITROGEN (as nitrate)
S = SULFATES
* = Details on methods that will be used to determine sample depths will be provided in the sampling plan.

APPENDIX A

DOCUMENTATION OF PRELIMINARY REVIEW (PR) INFORMATION SOURCES

Geoscience Consultants, Ltd.

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technichal Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE# PAD 044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT# 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 7-27-87 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants Ltd.

REPOSITORY US EPA Region III

REFERENCE CITATION Part B Application for Hazardous Waste Facility Permit under the Hazardous Waste Management Regulations 25 PA Code Chapter 75, Subchapter D for Cabot Berylco Division of Cabot Corporation

April 6, 1983

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: Includes Part A and Part B permit applications, description of hazardous waste management units and treatment facilities, data on waste characteristics and ground water monitoring, closure and post-closure plans, and background information of geology and hydrogeology.

RELEVANCE/UTILITY:

-- Unit characteristics
-- Waste characteristics
-- Migration pathways
-- Evidence of release
-- Exposure potential

Geoscience Consultants, Ltd.

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technichal Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE# PAD 044540136 EPA REGION III

LOCATION Reading, PA WORK ASSIGNMENT# 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 7-28-87 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants Ltd.

REPOSITORY GCL: WA 336 Correspondence file

REFERENCE CITATION Letter: David W. Wolfe (NGK Metals Corp.) to Gregory J. Contaldo (GCL) August 7, 1987

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: Describes past usage of ponds #1, #2, #3, #6, and red mud and lime sludge disposal areas. Includes types of wastes disposed of in these units. Also includes facility map showing the location of these disposal areas.

RELEVANCE/UTILITY:

-- Unit characteristics
-- Waste characteristics

Geoscience Consultants, Ltd.

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technichal Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE# PAD 044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT# 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 9-3-87 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants

REPOSITORY GCL: WA 336 Correspondence file

REFERENCE CITATION Telephone Record : Gregory J. Contaldo (GCL) to David W. Wolfe (NGK Metals Corp.)

August 9, 1987

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: Mr. Wolfe provided GCL with information on site owner/operator history, location of Former Pond #6, and informed GCL that a SWMU report was submitted to US EPA, Region III (Greg Koltonuk).

RELEVANCE/UTILITY:

- Background information (owner/operator history)
- Unit characteristics

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technical Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE # PAD044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT # 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 12-28-87 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants, Ltd.

REPOSITORY GCL: WA 336 Correspondence file

REFERENCE CITATION Letter: David W. Wolfe (NGK Metals Corp.) to Gregory Contaldo (GCL)
December 22, 1987

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: David Wolfe provided GCL with driller logs for each of four monitor wells located within the facility. Includes well completion information and lithologic descriptions.

RELEVANCE/UTILITY: -- Background information (lithology adjacent to screened interval)

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technical Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE #PAD 044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT # 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 1-6-88 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants, Ltd.

REPOSITORY GCL: WA 336 Document File

REFERENCE CITATION Wood, C.R., and MacLachlan, D.B., 1978, Geology and Groundwater Resources of Northern Berks County, Pennsylvania: Pennsylvania Department of Environmental Resources, Water Resource Report 44, 91 pp.

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: Comprehensive description and inventory of the geology and groundwater resources of Northern Berks County, Pennsylvania.

RELEVANCE/UTILITY: -- Background information (Geology, Hydrogeology and Demographics)

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technical Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE #PAD 044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT # 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 1-5-88 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants, Ltd.

REPOSITORY GCL: WA 336 Document File

REFERENCE CITATION U.S. Department of Commerce, Weather Bureau, "Local Climatological Data".

CALL NUMBER/FILE NUMBER (OR NAME)

ABSTRACT: Descriptive data of meteorological conditions for Berks County, Pennsylvania.

RELEVANCE/UTILITY: -- Background information (Meteorological Conditions)

INFORMATION SOURCE SUMMARY AND DOCUMENTATION FORM

U.S. EPA Technical Enforcement Support (TES)

SITE NAME NGK Metals Corp. SITE #PAD 044540136 EPA REGION III

LOCATION Reading, Pennsylvania WORK ASSIGNMENT # 336

NATURE OF ENFORCEMENT ACTIVITY RCRA Facility Assessment (RFA)

DATE 12-31-87 REVIEWED BY Greg Contaldo FIRM Geoscience Consultants, Ltd.

REPOSITORY GCL: WA 336 Document File

REFERENCE CITATION The Reading Times, July 8, 1981, Gains, Losses in Population of Berks Areas

CALL NUMBER/FILE NUMBER (OR NAME)

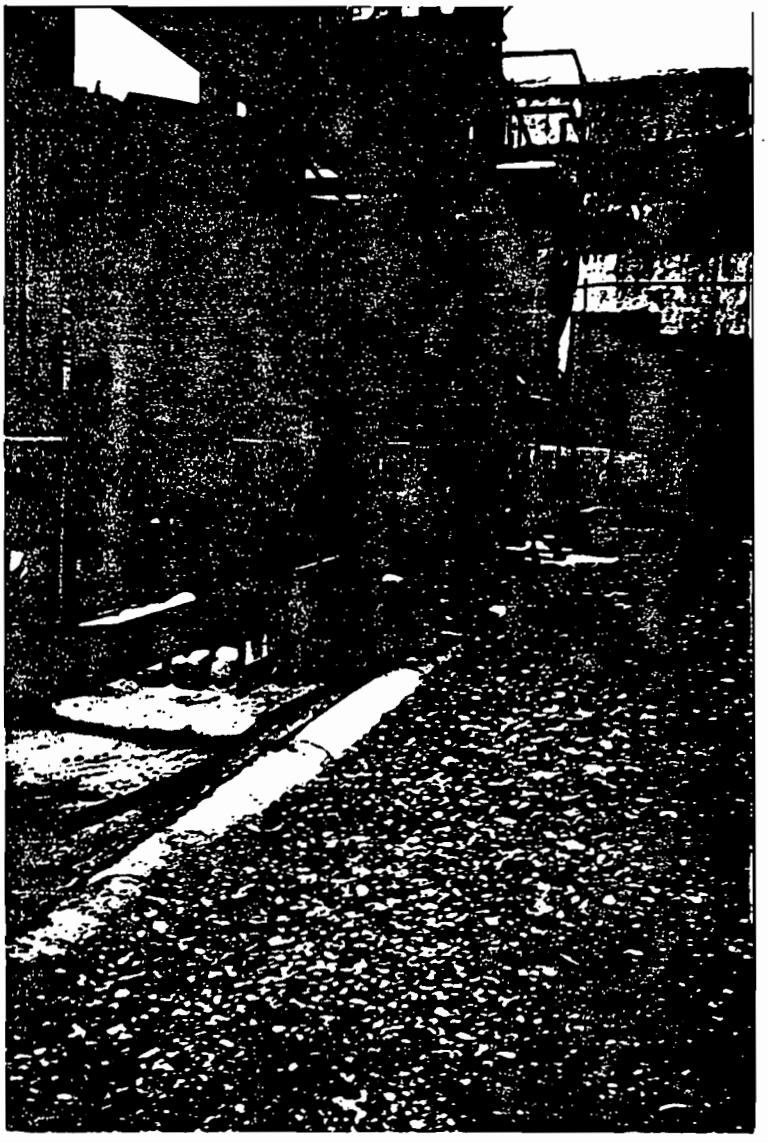
ABSTRACT: Listing of population census and census projection for cities, boroughs and townships located within Berks County, Pennsylvania. Source of data includes U.S. Bureau of the Census and Berks County Planning Commission.

RELEVANCE/UTILITY: -- Background information (Demographics)

APPENDIX B

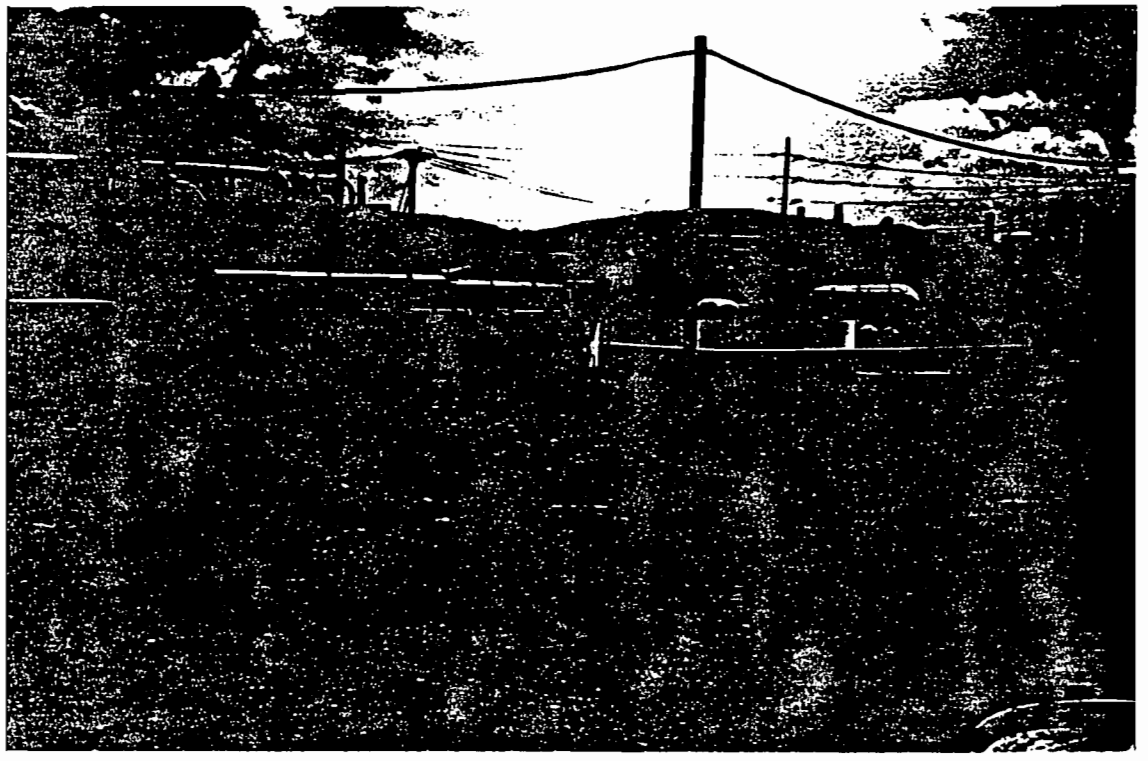
VISUAL SITE INSPECTION (VSI)
PHOTOGRAPHIC DOCUMENTATION

PHOTO B-1



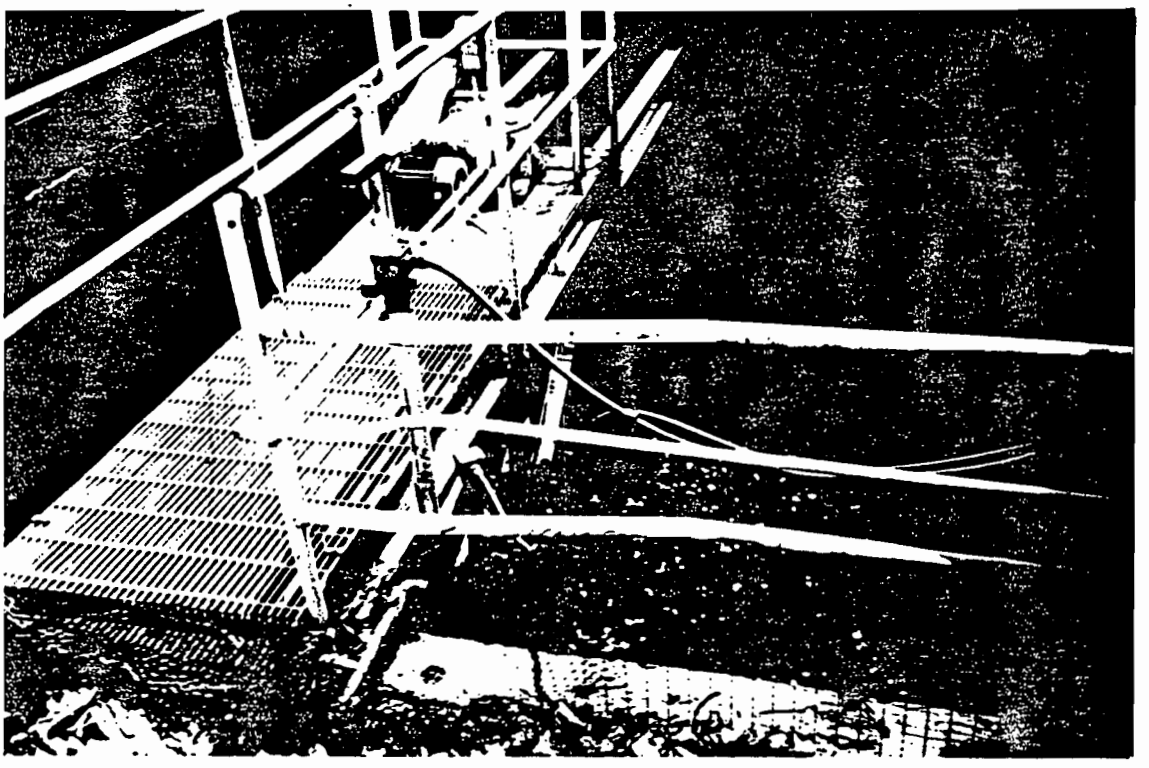
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: South
PICTURE DESCRIPTION: Spent Acid Storage Tanks

PHOTO B-2



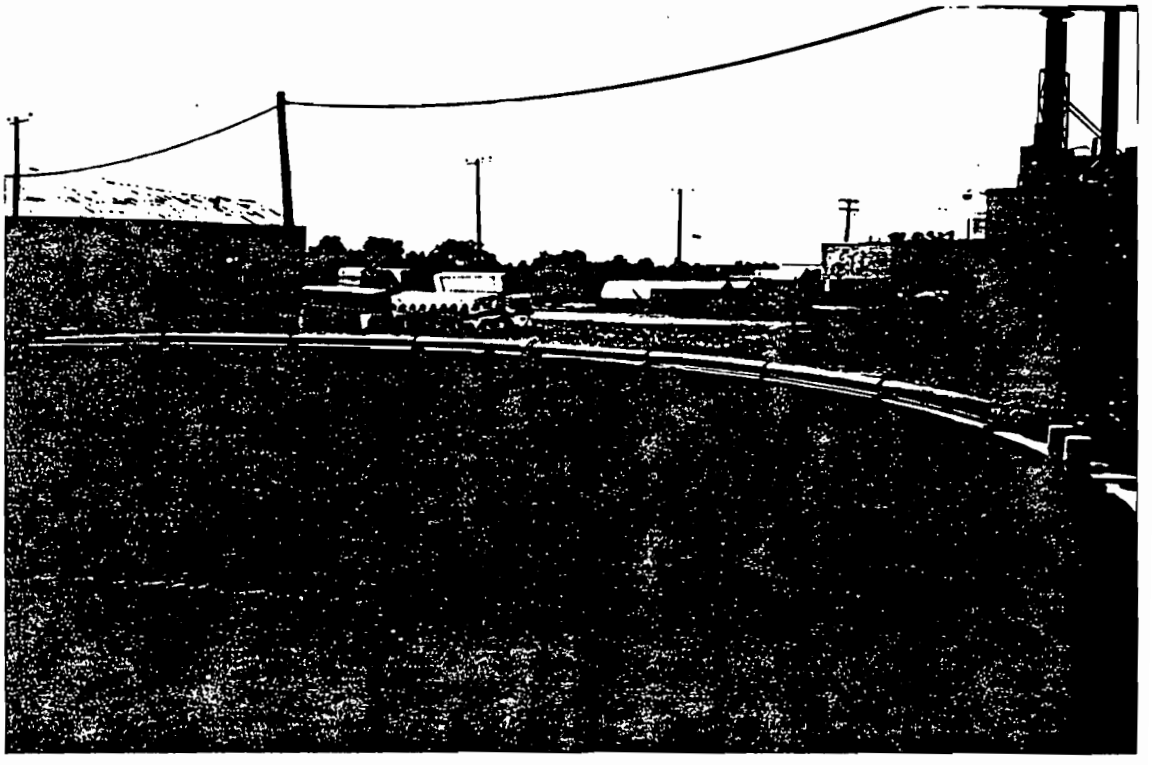
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southeast
PICTURE DESCRIPTION: Waste Treatment Facility - settling and emergency storage tanks

PHOTO B-3



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: West
PICTURE DESCRIPTION: Waste Treatment Facility - neutralization tank

PHOTO B-4

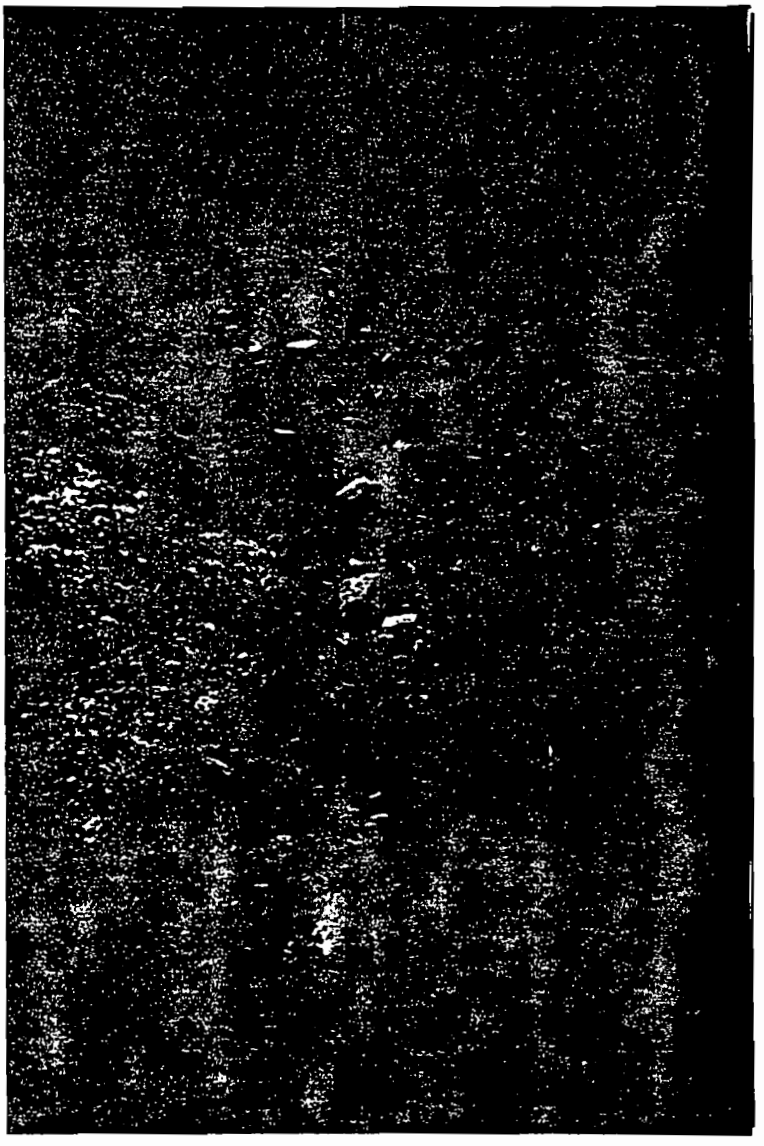


DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southwest
PICTURE DESCRIPTION: Waste Treatment Facility - emergency storage tank

PHOTO B-5

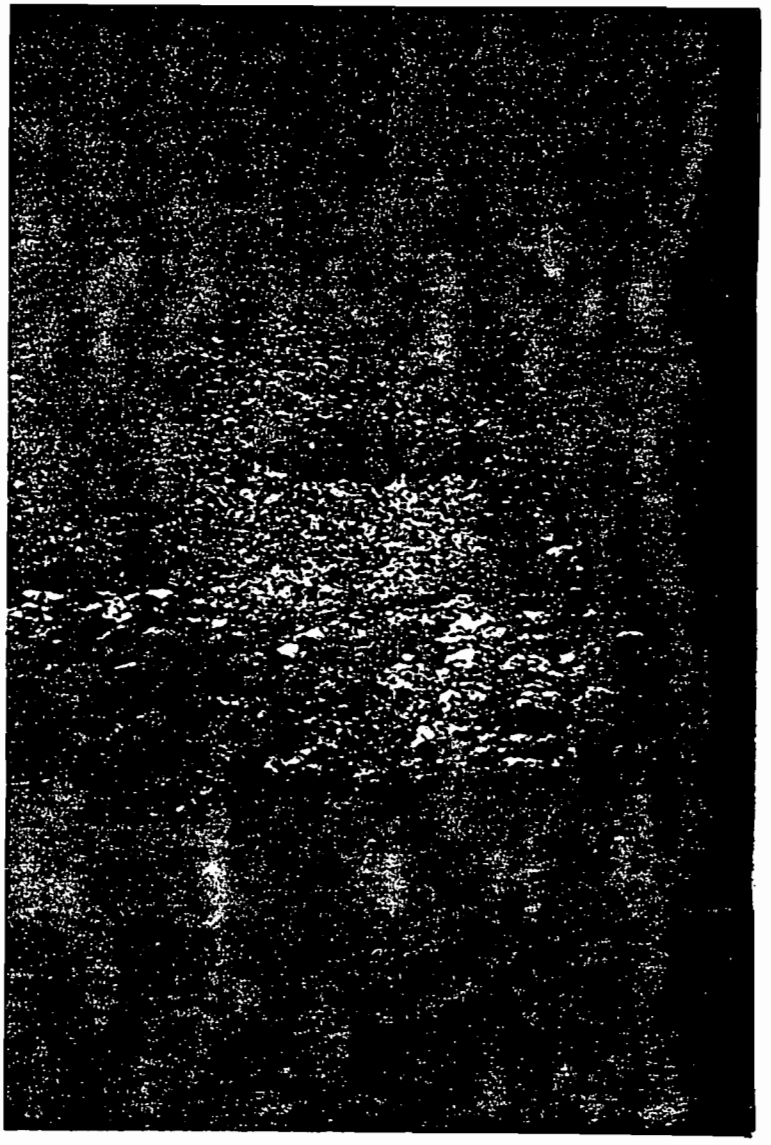
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: South
PICTURE DESCRIPTION: Existing Landfill - eastern berm

PHOTO B-6



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: South
PICTURE DESCRIPTION: Existing Landfill - graded landfill surface

PHOTO B-7



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southwest
PICTURE DESCRIPTION: Existing Landfill - graded landfill surface

PHOTO B-8

DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: East
PICTURE DESCRIPTION: Existing Landfill - northern berm

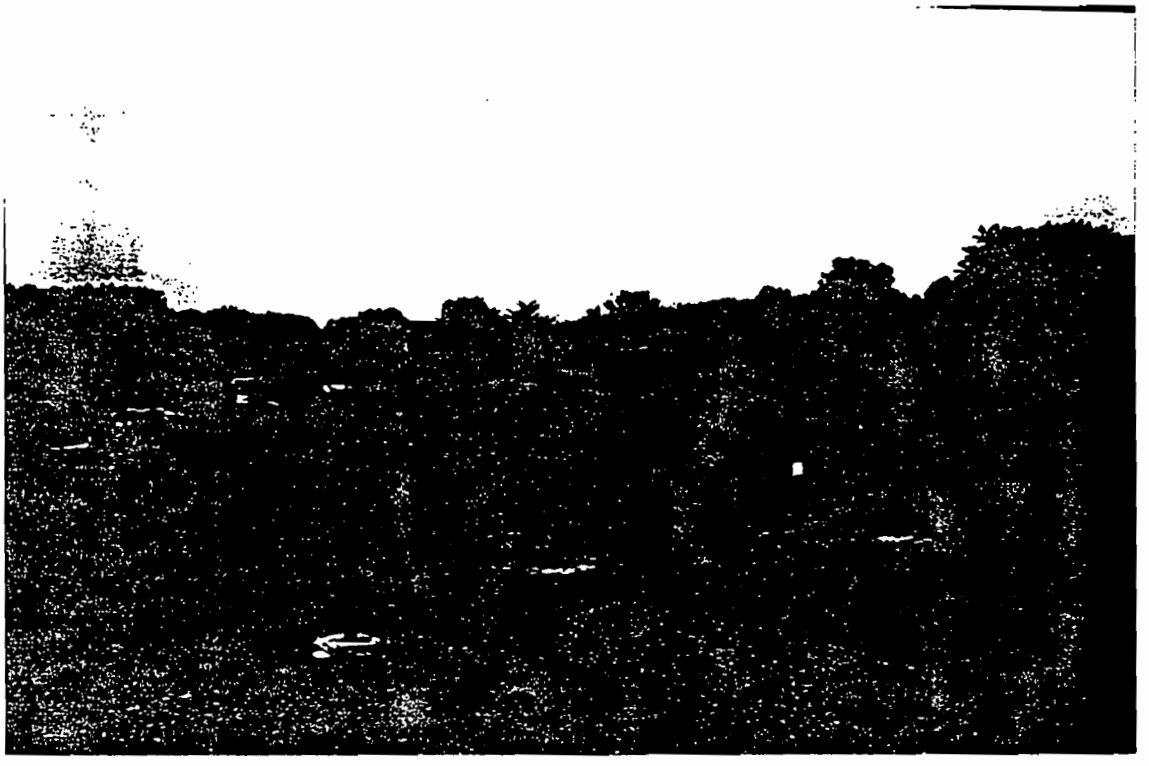
PHOTO B-9

DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southeast
PICTURE DESCRIPTION: Existing Landfill - from road entrance

PHOTO B-10

DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Northwest
PICTURE DESCRIPTION: Existing Landfill - collection tanks

PHOTO B-11

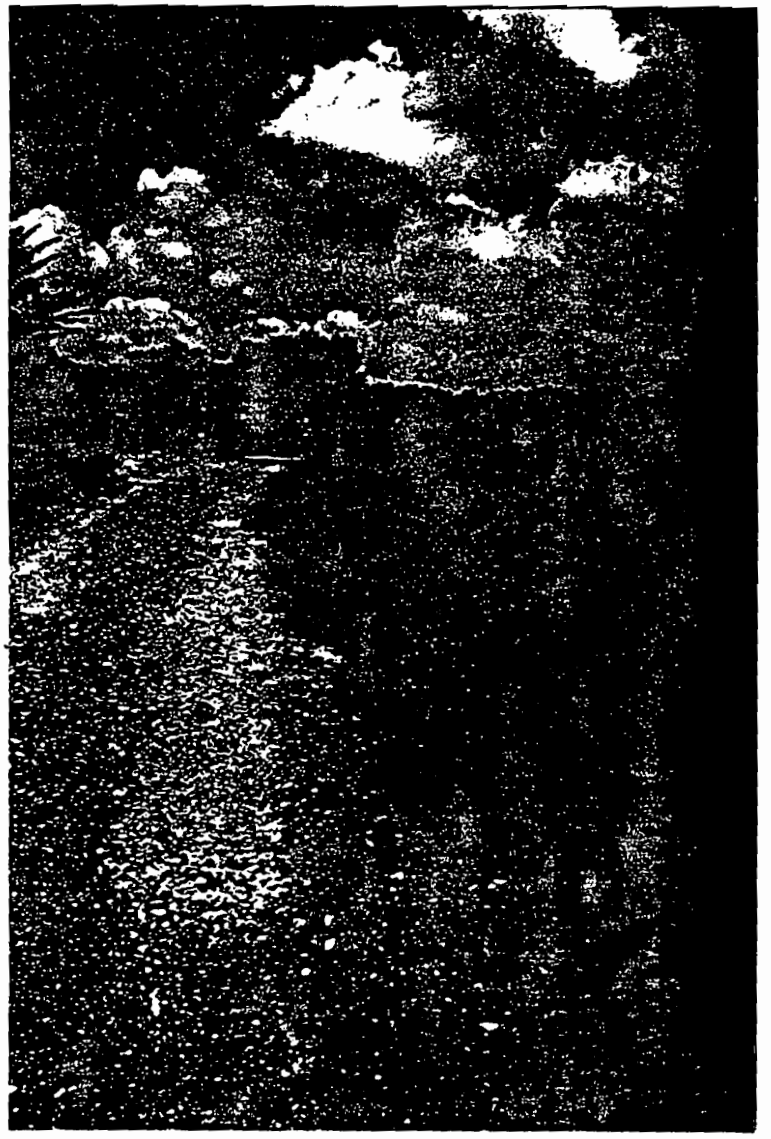


DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Northwest
PICTURE DESCRIPTION: Drum Storage Area - west of rolling mill

PHOTO B-12

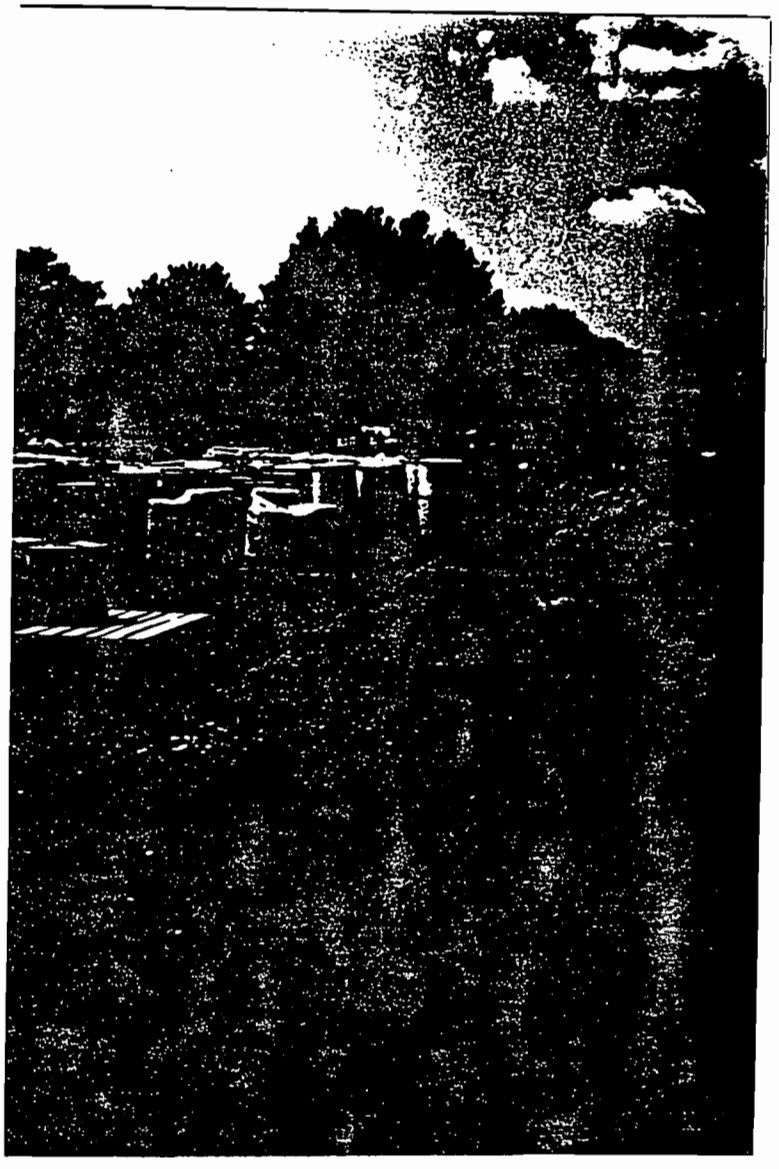
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southwest
PICTURE DESCRIPTION: Drum Storage Area - northeast of landfill

PHOTO B-13



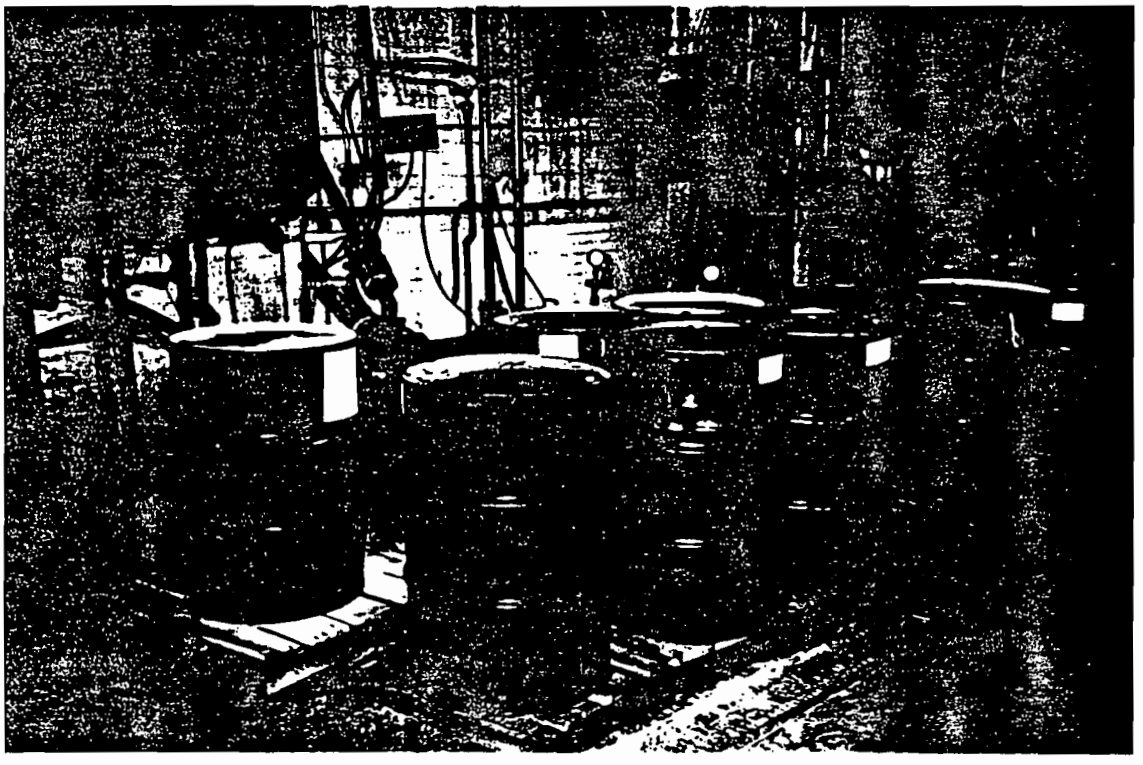
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: North
PICTURE DESCRIPTION: West Berm of Existing Landfill and Drum Storage Area

PHOTO B-14



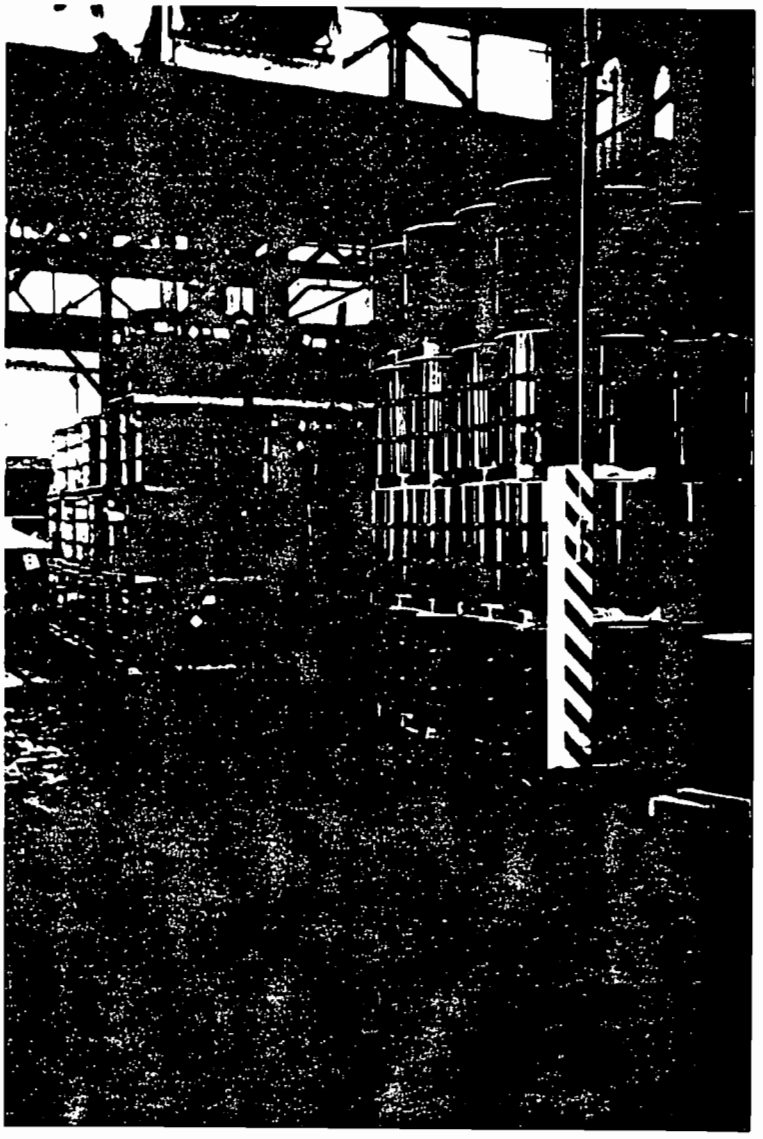
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southwest
PICTURE DESCRIPTION: Drum Storage Area - south of rolling mill

PHOTO B-15



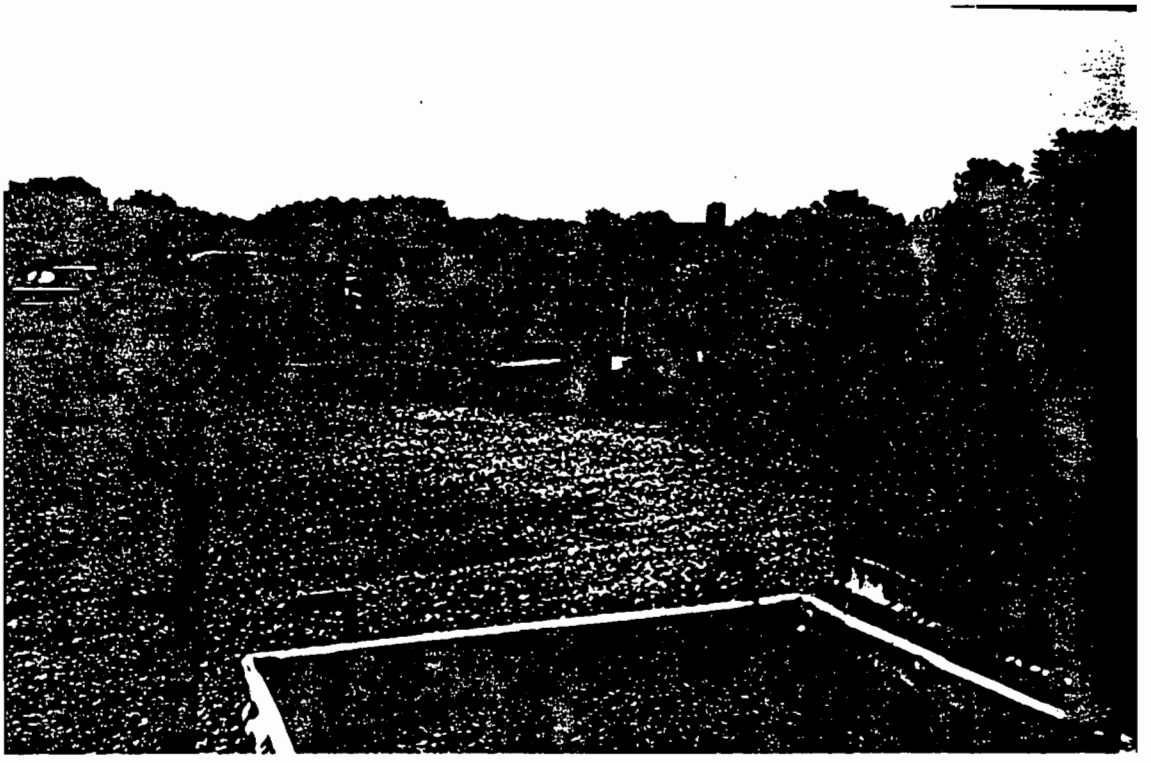
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Northwest
PICTURE DESCRIPTION: TCA 1,1,1 Drum Storage Area

PHOTO B-16



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: North
PICTURE DESCRIPTION: Drum Storage area - inside of building

PHOTO B-17



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: West
PICTURE DESCRIPTION: Drum Storage Area - west of rolling mill

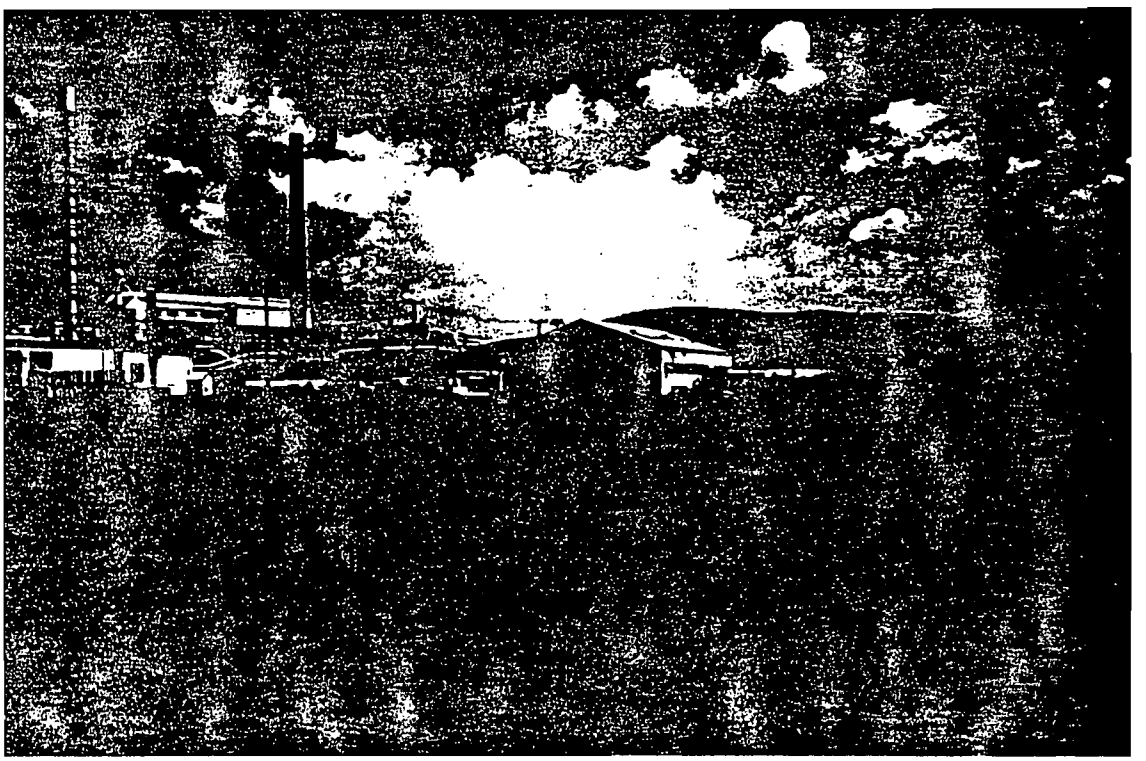
PHOTO B-18

DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southeast
PICTURE DESCRIPTION: Waste Treatment Facility - emergency storage tank

PHOTO B-19

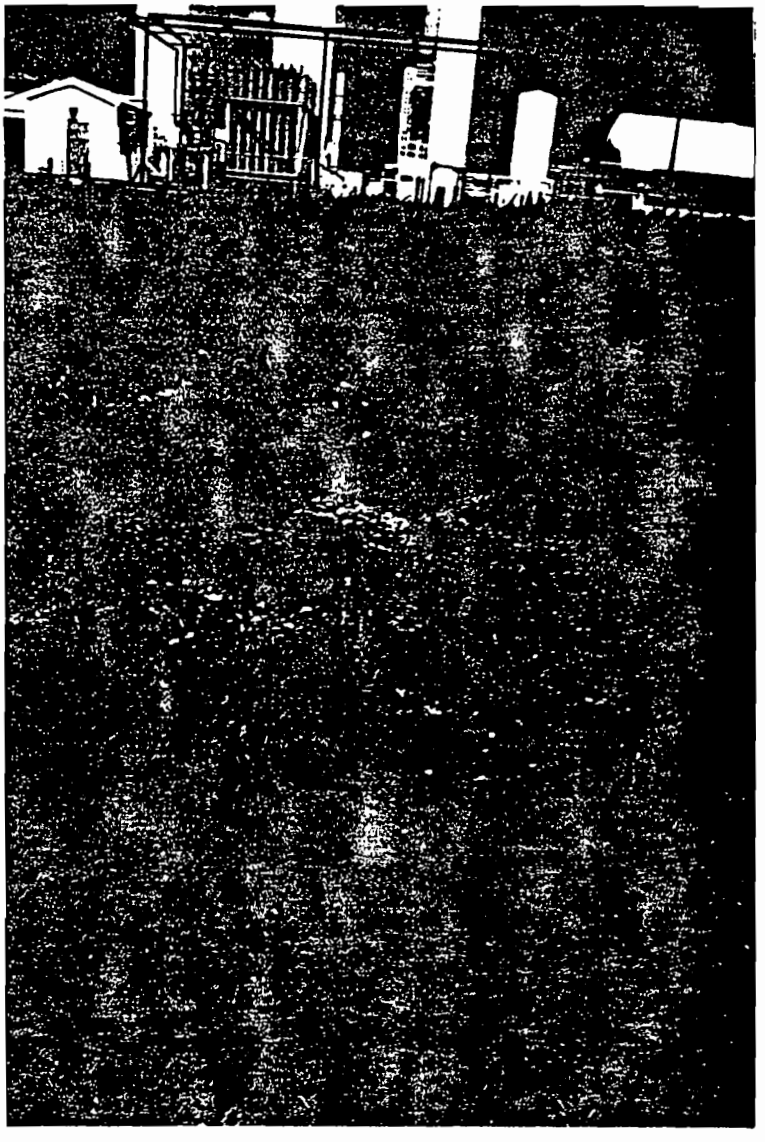
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Northeast
PICTURE DESCRIPTION: Drum Storage Area - inside of building

PHOTO B-20



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Northeast
PICTURE DESCRIPTION: Red Mud and Lime Sludge Disposal Areas

PHOTO B-21

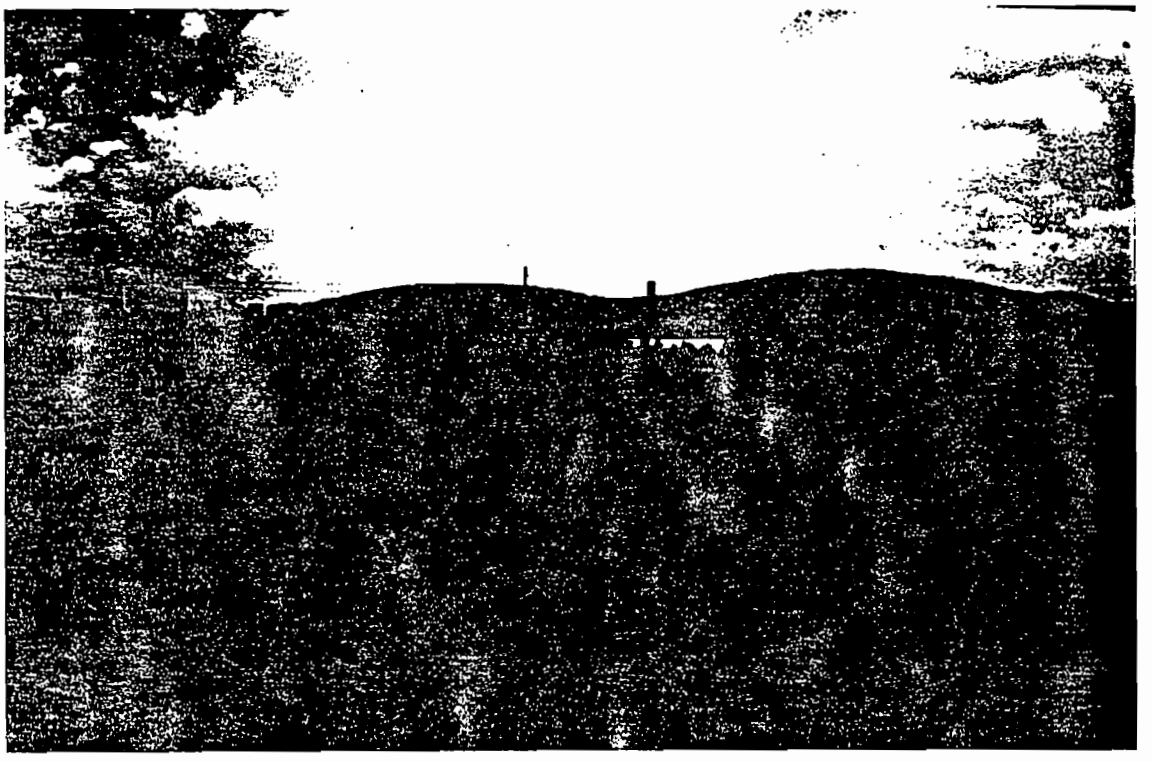


DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: North
PICTURE DESCRIPTION: Red Mud and Lime Sludge Disposal Areas

PHOTO B-22

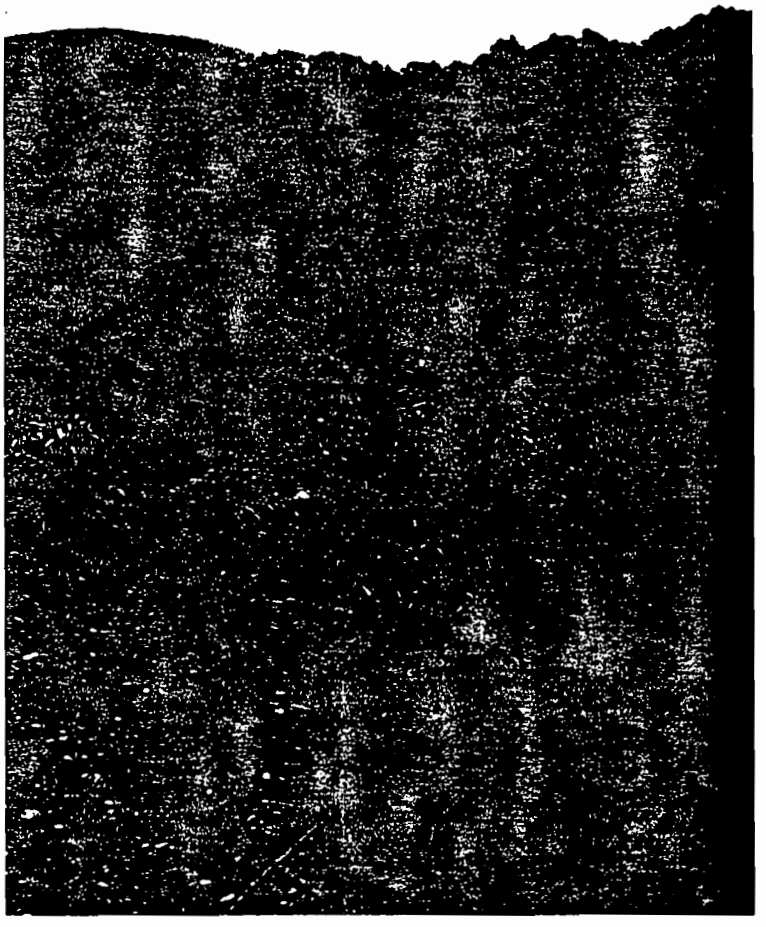
DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southwest
PICTURE DESCRIPTION: Red Mud and Lime Sludge Disposal Areas

PHOTO B-23



DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: Southeast
PICTURE DESCRIPTION: Red Mud and Lime Sludge Disposal Areas

PHOTO B-24

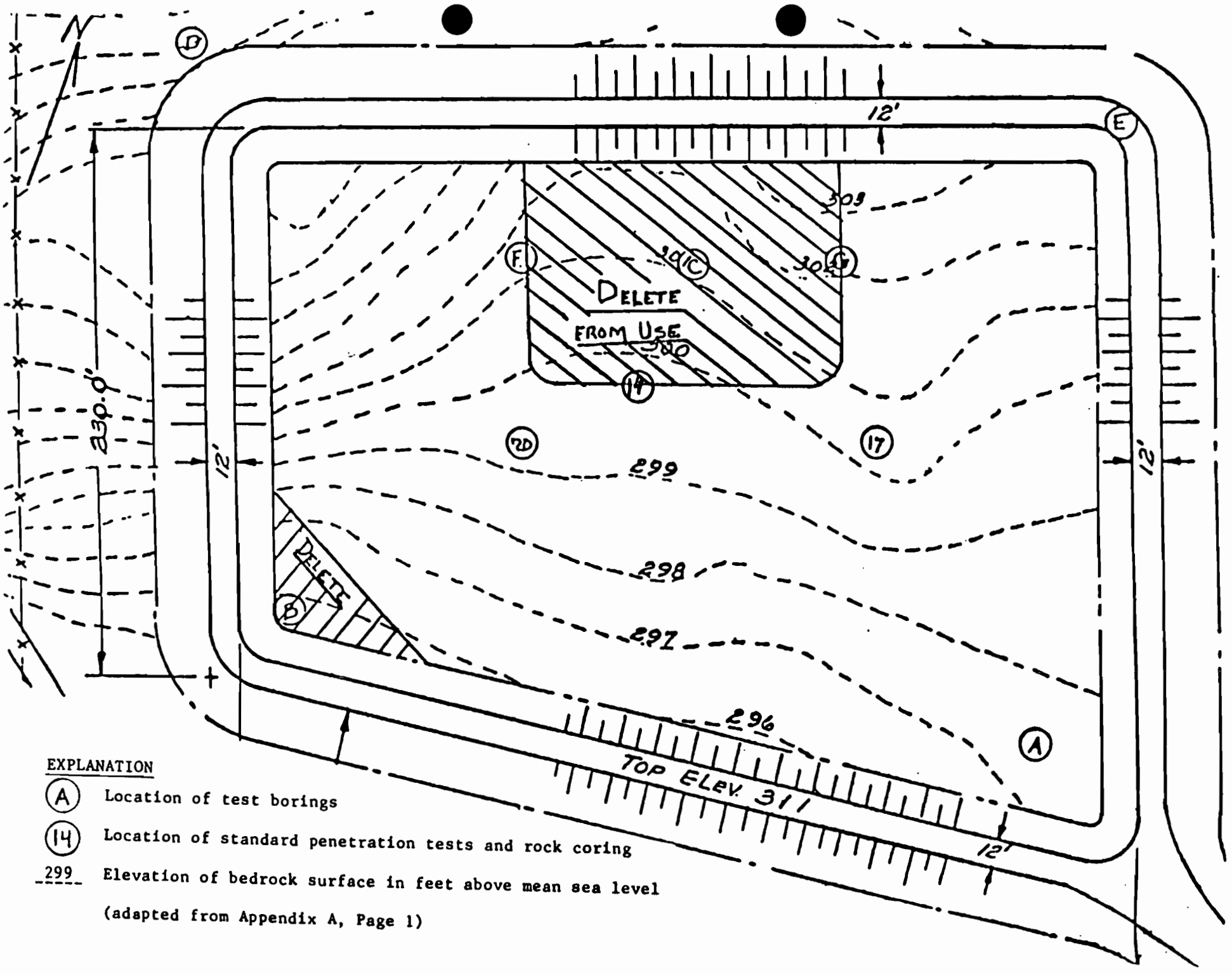


DATE: 8-4-87 PLANT: NGK Metals Corp. DIRECTION FACING: South
PICTURE DESCRIPTION: Red Mud and Lime Sludge Disposal Areas

APPENDIX C

LOCATIONS AND LOGS OF TEST BORINGS WITHIN AND IMMEDIATELY ADJACENT TO THE EXISTING LANDFILL, NGK METALS CORPORATION, READING, PENNSYLVANIA

SOURCE: APPENDIX A, PAGE 1



EXPLANATION

(A) Location of test borings

(14) Location of standard penetration tests and rock coring

299 Elevation of bedrock surface in feet above mean sea level

(adapted from Appendix A, Page 1)

CASING BLOWS	
0- 1	
1- 2	
2- 3	
3- 4	
4- 5	
5- 6	
6- 7	
7- 8	
8- 9	
9-10	
10-11	
11-12	
12-13	
13-14	
14-15	
15-16	
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40-41	
41-42	
42-43	
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44-45	
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46-47	
47-48	
48-49	
49-50	
50-51	
51-52	
52-53	
53-54	
54-55	

PROJECT Proposed Landfill
LOCATION RBI, Inc., Reading Plant

BORING Nº A GROUND ELEV. 297.5 B.M ELEV. Plan

BEGIN BORING: DATE 8/23/76 TIME 130
FINISH BORING: DATE 8/23/76 TIME 143

DRIVE HAMMER { DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; CASING SIZE ____ }
SPOON HAMMER { DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; SPOON SIZE ____ INCHES }

WATER OBSV. PIPE ____ FT.
CORE BIT SIZE ____
UNDISTURBED SAMPLE SIZE ____ INCHES O.D.
ANGLE OF INCLINATION ____
WATER PRES. TEST ____

GROUND WATER

DATE	TIME AM	TIME PM	DEPTH
8/24/76	0845	--	3.4
8/25/76	0915	--	3.4
8/31/76	0905	--	3.4

IF NO WATER ENCOUNTERED SO STATE

CLASSIFICATION OF MATERIAL		EARTH			CORE				ALT
DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	RUN NUMBER	DEPTH FROM-TO	LENGTH OF RECOVERY	% OF RECOVERY	
0.0' to 7.0'	Medium to large cobbles with medium grained yellow-brown sand								
7.0' to 9.0'	Yellow-brown to brown silty clayey gravel (damp)								
9.0' to 25.0'	Yellow-brown silty clay with some gravel (moist)								
25.0' to 31.0'	Yellow-brown silty clay with trace gravel (wet)								
	Refusal at 31.0'								

JOB Nº 2872--8 RIG Nº --- WEATHER Sunny TEMP. 90's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF

CASING BLOWS

PROJECT Proposed Landfill
LOCATION KBI, Inc. - Reading Plant
BORING No. B GROUND ELEV. 296 B.M. ELEV. Plan

BEGIN BORING: DATE 8/23/76 TIME 2:30
FINISH BORING: DATE 8/23/76 TIME 3:30

DRIVE HAMMER { DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; CASING SIZE ____ }
SPOON HAMMER { DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; SPOON SIZE ____ INCHES }

WATER OBSV. PIPE ____ FT.
CORE BIT SIZE ____
UNDISTURBED SAMPLE SIZE ____ INCHES O.D.
ANGLE OF INCLINATION ____
WATER PRES. TEST ____

GROUND WATER	DATE	TIME AM	TIME PM	DEPTH
	8/24/76	1200	--	Caved

OF HRS WATER ENCOUNTERED BELOW GRADE

CLASSIFICATION OF MATERIAL		EARTH			CORE				REMARKS
DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	RUN NUMBER	DEPTH FROM-TO	LENGTH OF RECOVERY	% OF RECOVERY	
0.0' to 7.0'	Pebbles and cobbles with medium grained yellow-brown sand								
7.0' to 10.0'	Yellow-brown fine grained sand with pebbles and cobbles and some clay and silt								
10.0' to 20.0'	Yellow-brown fine grained sandy, silty clay with few rock fragments (wet)								
20.0' to 35.0'	Brown clayey silt with some sand and gravel								
35.0' to 40.0'	Brown clayey silt with some sand and gravel and decomposed bedrock fragments								
40.0' to 54.0'	Yellow-brown silty clay with some sand								
	Refusal at 54.0'								

JOB No. 2872--8 RIG No. -- WEATHER Sunny TEMP. 90's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF 1

PROJECT Proposed Landfill
LOCATION KBL, Inc., Reading Plant
BORING Nº C GROUND ELEV. 301 B.M. ELEV. Plan

BEGIN BORING: DATE 8/31/76 TIME 0930
FINISH BORING: DATE 8/31/76 TIME 1110

DRIVE HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; CASING SIZE ____
SPOON HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; SPOON SIZE ____ INCHES
WATER OBSV. PIPE ____ FT.; CORE BIT SIZE ____; UNDISTURBED SAMPLE SIZE ____ INCHES O.D.; ANGLE OF INCLINATION ____; WATER PRES. TEST ____

GROUND WATER	DATE	TIME AM	TIME PM	DEPT
	8/31/76	1110	--	11.5

IF NO WATER ENCOUNTERED WRITE "NON

CASING BLOWS	DEPTH FROM-TO	CLASSIFICATION OF MATERIAL: DESCRIPTION	EARTH: SAMPLE NUMBER	EARTH: DEPTH FROM-TO	EARTH: SPOON BLOWS PER 6 INCHES	CORE: RUN NUMBER	CORE: DEPTH FROM-TO	CORE: LENGTH OF RECOVY	CORE: % OF RECOVY	REMA
0-1	0.0' to 5.0'	Yellow-brown sandy silt with clay, pebbles and cobbles								
5-6	5.0' to 15.0'	Brown sand, silt, and clay with pebbles								
15-16	15.0' to 35.0'	Brown sandy silty clay with few pebbles								
35-36	35.0' to 52.0'	Yellow silty clay with some sand (wet)								
52-53	52.0' to 67.0'	Yellow-Brown silty clay with decomposed bed-rock and some sand								
		Refusal at 67.0'								

JOB Nº 2872--8 RIG Nº -- WEATHER Sunny TEMP. 70's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF 1

PROJECT Proposed Landfill
LOCATION KBI, Inc., Reading Plant
BORING Nº D GROUND ELEV. 308 B.M. ELEV. Plan

BEGIN BORING: DATE 8/23/76 TIME 1000
FINISH BORING: DATE 8/23/76 TIME 1100

DRIVE HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; CASING SIZE ____
SPOON HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; SPOON SIZE ____ INCHES
WATER OBSV. PIPE ____ FT.
CORE BIT SIZE ____
UNDISTURBED SAMPLE SIZE ____ INCHES O.D.
ANGLE OF INCLINATION ____
WATER PRES. TEST ____

GROUND WATER	DATE	TIME AM	TIME PM	DEPTH
	8/23/76	1100	--	Dry
	8/24/76	0840	--	Dry
	8/30/76	0930	--	Dry

Ø IF NO WATER IS ENCOUNTERED CASE = NONE

CASING BLOWS	DEPTH FROM-TO	CLASSIFICATION OF MATERIAL DESCRIPTION	EARTH SAMPLE NUMBER	EARTH DEPTH FROM-TO	EARTH SPOON BLOWS PER 6 INCHES	C.C.R. RUN NUMBER	C.C.R. DEPTH FROM-TO	C.C.R. LENGTH OF RECOVY	C.C.R. % OF RECOVY	REMA
0-1	0.0' to 13.0'	Reddish-brown silty clay with trace sand and some rock fragments								
1-2										
2-3										
3-4										
4-5										
5-6										
6-7										
7-8										
8-9										
9-10										
10-11										
11-12										
12-13										
13-14										
14-15										
15-16										
16-17										
17-18	13.0' to 33.0'	Brown to yellow-brown silty clay with some rock fragments								
18-19										
19-20										
20-21										
21-22										
22-23										
23-24										
24-25										
25-26										
27		Refusal at 33.0'								
27-28										
28-29										
29-30										
30-31										
31-32										
32-33										
33-34										
34-35										
35-36										
36-37										
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52-53										
53-54										
54-55										

JOB Nº 2872--8 RIG Nº -- WEATHER Sunny TEMP 80's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF

PROJECT Proposed Landfill
LOCATION KBI, Inc., Reading Plant
BORING No. E GROUND ELEV. 311 B.M. ELEV. Plan

BEGIN BORING: DATE 8/31/76 TIME 1220
FINISH BORING: DATE 8/31/76 TIME 1330

DRIVE HAMMER: DISTANCE DROP ___ INCHES; WEIGHT ___ POUNDS; CASING SIZE ___
SPOON HAMMER: DISTANCE DROP ___ INCHES; WEIGHT ___ POUNDS; SPOON SIZE ___ INCHES

WATER OBSV. PIPE ___ FT.
CORE BIT SIZE ___
UNDISTURBED SAMPLE SIZE ___ INCHES O.D.
ANGLE OF INCLINATION ___
WATER PRES. TEST ___

GROUND WATER

DATE	HOUR AM	HOUR PM	DEPTH
8/31/76	1330	--	22.8'

IF NO WATER IS ENCOUNTERED WRITE "NONE"

CASING BLOWS	DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	EARTH DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	CORE RUN NUMBER	CORE DEPTH FROM-TO	LENGTH OF RECOVY	% OF RECOVY	REMARKS
	0.0' to 5.0'	Fill								
	5.0' to 25.0'	Brown sandy clayey silt with some gravel and pebbles								
	25.0' to 50.0'	Brown silty clay with some pebbles; trace sand								
		Refusal at 50.0'								

JOB No. 2872--8 RIG No. -- WEATHER Sunny TEMP. 70's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF 1

PROJECT Proposed Landfill
LOCATION KBI, Inc., Reading Plant
BORING Nº F GROUND ELEV. 301 B.M. ELEV. Plan

BEGIN BORING: DATE 8/31/76 TIME 1330
FINISH BORING: DATE 8/31/76 TIME 1400

DRIVE HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; CASING SIZE ____
SPOON HAMMER: DISTANCE DROP ____ INCHES; WEIGHT ____ POUNDS; SPOON SIZE ____ INCHES
WATER OBSV. PIPE ____ FT.; CORE BIT SIZE ____; UNDISTURBED SAMPLE SIZE ____ INCHES O.D.; ANGLE OF INCLINATION ____; WATER PRES. TEST ____

GROUND WATER	DATE	HOUR AM	HOUR PM	DEPTH
	8/31/76	--	1400	Caved

Ø IF NO WATER ENCOUNTERED WRITE "NONE"

CASING BLOWS	DEPTH FROM-TO	CLASSIFICATION OF MATERIAL: DESCRIPTION	EARTH: SAMPLE NUMBER	EARTH: DEPTH FROM-TO	EARTH: SPOON BLOWS PER 6 INCHES	CORE: RUN NUMBER	CORE: DEPTH FROM-TO	CORE: LENGTH OF RECOVY	CORE: % OF RECOVY	REMARKS
0- 1	0.0' to 8.0'	Pebbles with brown sandy clay; trace silt								
8- 9	8.0' to 15.0'	Brown slightly sandy silty clay with some pebbles								
15-16	15.0' to 17.0'	Yellow-brown silty clay								
16-17		Refusal at 17.0'								

JOB Nº 2872--8 RIG Nº -- WEATHER Sunny TEMP 70's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1

PROJECT Proposed Landfill
LOCATION KBI, Inc., Reading Plant
BORING Nº. G GROUND ELEV. 302 B.M.ELEV. Plan

BEGIN BORING: DATE 8/31/76 TIME 1415
FINISH BORING: DATE 8/31/76 TIME 1500

DRIVE HAMMER: DISTANCE DROP ___ INCHES; WEIGHT ___ POUNDS; CASING SIZE ___
SPOON HAMMER: DISTANCE DROP ___ INCHES; WEIGHT ___ POUNDS; SPOON SIZE ___ INCHES

WATER OBSV. PIPE ___ FT.
CORE BIT SIZE ___
UNDISTURBED SAMPLE SIZE ___ INCHES O.D.
ANGLE OF INCLINATION ___
WATER PRES. TEST ___

GROUND WATER			
DATE	HOUR A.M.	HOUR P.M.	DEPTH
8/31/76	--	1500	Caved

CLASSIFICATION OF MATERIAL		EARTH			CORE				REMARKS
DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	RUN NUMBER	DEPTH FROM-TO	LENGTH OF RECOVY	% OF RECOVY	
0.0' to 5.0'	Pebbles and cobbles with silt and clay								
5.0' to 25.0'	No Recovery								
25.0' to 39.0'	Yellow sandy clay with some silt								
	Refusal at 39.0'								

CASING BLOWS: 1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55 (no entries)

JOB Nº 2872--8 RIG Nº --- WEATHER Sunny TEMP. 70's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF 1

PROJECT: Proposed Landfill
LOCATION: KBI, Inc., Reading Plant
BORING Nº: 14 GROUND ELEV.: 299.5 B.M. ELEV.: Plan

BEGIN BORING: DATE 8/27/76 TIME 0930
FINISH BORING: DATE 8/27/76 TIME 1500

DRIVE HAMMER: DISTANCE DROP N/A INCHES; WEIGHT ___ POUNDS; CASING SIZE ___
SPOON HAMMER: DISTANCE DROP 30 INCHES; WEIGHT 140 POUNDS; SPOON SIZE 2 INCHES

WATER OBSV. PIPE N/A FT.
CORE BIT SIZE BX
UNDISTURBED SAMPLE SIZE ___ INCHES O.D.
ANGLE OF INCLINATION ___
WATER PRES. TEST ___

GROUND WATER: DATE	HOUR AM	HOUR PM	DEPTH
8/30/76	0925	---	8.00
8/31/76	0905	---	8.05

IF NO WATER IS ENCOUNTERED STATE "NONE"

CLASSIFICATION OF MATERIAL: DEPTH FROM-TO	DESCRIPTION	EARTH: SAMPLE NUMBER	EARTH: DEPTH FROM-TO	EARTH: SPOON BLOWS PER 6 INCHES	CORE: RUN NUMBER	CORE: DEPTH FROM-TO	CORE: LENGTH OF RECOVY	CORE: % OF RECOVY	REMAR…
0.0' to 7.0'	Rock fragments and pebbles with yellow-brown fine to medium grained sand and trace clay	1	4.0' - 5.5'	18-12-17					No Recov…
7.0' to 24.5'	Brown to yellow-brown silty clay with some saprolitic rock fragments; trace fine sand	2	9.0'-10.5'	2-3-3					
		3	14.0'-15.5'	6-7-7					
		4	19.0'-20.5'	2-1-2					
		5	24.0'-25.5'	50/1"					
24.5' to 29.5'	Medium gray, massive, finely crystaline limestone with white fracture filling				1	24.5'-29.5'	57"	95	
	Terminated boring at 29.5'								

JOB Nº 2872--8 RIG Nº -- WEATHER overcast TEMP. 80's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF ___

CASING BLOWS

PROJECT Proposed Landfill
LOCATION KBI, Inc., Reading Plant
BORING No. 17 GROUND ELEV. 300.5 B.M. ELEV. Plan

BEGIN BORING: DATE 8/25/76 TIME 1315
FINISH BORING: DATE 8/26/76 TIME 1000

DRIVE HAMMER: DISTANCE DROP N/A INCHES; WEIGHT ____ POUNDS; CASING SIZE ____
SPOON HAMMER: DISTANCE DROP 30 INCHES; WEIGHT 140 POUNDS; SPOON SIZE 2 INCHES
WATER OBSV. PIPE N/A FT
CORE BIT SIZE BX
UNDISTURBED SAMPLE SIZE ____ INCHES O.D.
ANGLE OF INCLINATION ____
WATER PRES. TEST ____

GROUND WATER	DATE	TIME AM	TIME PM	DEPT
	8/26/76	1000	---	Cave

@ ## BOULDERS ENCOUNTERED @ ## FEET

CLASSIFICATION OF MATERIAL		EARTH			CORE				REM.
DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	RUN NUMBER	DEPTH FROM-TO	LENGTH OF RECOVERY	% OF RECOVERY	
0.0' to 9.0'	Rock fragments and pebbles with yellow-brown to buff fine grained sand, silt, and clay (moist)								
		1	4.0' - 5.5'	24-50/2"					No Rec
9.0' to 14.0'	Brown to reddish-brown silty clay with saprolitic rock fragments and pebbles (moist)	2	9.0'- 10.5'	9-9-7					
14.0' to 34.0'	Brown to yellow-brown silty clay with some saprolitic rock fragments and few pebbles	3	14.0'- 15.5'	4-3-3					
		4	19.0'- 20.5'	4-4-5					
		5	24.0'- 25.5'	9-13-19					
		6	29.0'- 30.5'	4-6-8					
34.0' to 34.1'	Pulverized gray limestone bedrock	7	34.0'- 34.1'	50/1"					
	Terminate boring at 34.1' Sheared off 15.0' of augers impossible to core.								

JOB No. 2872--8 RIG No. -- WEATHER Sunny TEMP. 80's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF

PROJECT: Proposed Landfill
LOCATION: KBI, Inc., Reading Plant
BORING No. 20 GROUND ELEV. 299.5 B.M. ELEV. Plan

BEGIN BORING: DATE 8/30/76 TIME 1000
FINISH BORING: DATE 8/30/76 TIME 1500

DRIVE HAMMER: DISTANCE DROP N/A INCHES; WEIGHT ____ POUNDS; CASING SIZE ____
SPOON HAMMER: DISTANCE DROP 30 INCHES; WEIGHT 140 POUNDS; SPOON SIZE 2 INCHES

WATER OBSV. PIPE N/A FT.
CORE BIT SIZE AX
UNDISTURBED SAMPLE SIZE ____ INCHES O.D.
ANGLE OF INCLINATION ____
WATER PRES. TEST ____

GROUND WATER DATE	HOUR A.M.	HOUR P.M.	DEPTH
8/31/76	0845	---	7.05

IF NO WATER IS ENCOUNTERED SO STATE: NONE

CASING BLOWS	DEPTH FROM-TO	DESCRIPTION	SAMPLE NUMBER	EARTH DEPTH FROM-TO	SPOON BLOWS PER 6 INCHES	CORE RUN NUMBER	CORE DEPTH FROM-TO	LENGTH OF RECOVERY	% OF RECOVERY	REMARKS
	0.0' to 2.0'	Cobbles and pebbles with clayey silt								
	2.0' to 31.5'	Yellow-brown to brown silty clay; some pebbles; few saprolitic rock fragments after 24.0'	1	4.0'-5.5'	33-12-15					No Recove[ry]
			2	9.0'-10.5'	4-5-4					
			3	14.0'-15.5'	4-4-5					
			4	19.0'-20.5'	2-3-4					
			5	24.0'-25.5'	3-5-5					
			6	29.0'-30.5'	8-8-9					
	31.5' to 36.5'	Medium gray, massive finely crystaline limestone with white fracture filling				1	31.5'-36.5'	43"	72	
		Terminate boring at 36.5'								

JOB No. 2872--8 RIG No. -- WEATHER Sunny TEMP. 70's
DRILLER Nick Bruno HELPER Dan Elper SHEET 1 OF 1

APPENDIX D

SUMMARY OF GROUND WATER ANALYTICAL DATA INDICATING PARAMETERS THAT EXCEED PRIMARY AND SECONDARY DRINKING WATER STANDARDS NGK METALS CORPORATION, READING, PENNSYLVANIA

SOURCE: APPENDIX A, PAGE 1

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
001	9-13-84	Fluoride	28.3	1.4-2.4	
		Chromium	0.62	0.05	
		Iron	3.2		0.3
		Sulfate	289		250
		pH	8.93*		6.5-8.5
		TDS	850*		500
001	6-21-84	Fluoride	24.0	1.4-2.4	
		Chromium	0.63	0.05	
		Iron	2.5		0.3
		Sulfate	298		250
		pH	9.02*		6.5-8.5
		TDS	798*		500
001	3-27-84	Fluoride	39.3	1.4-2.4	
		Chromium	0.70	0.05	
		Iron	2.32		0.3
		pH	9.05*		6.5-8.5
		TDS	852*		500
001	12-01-83	Fluoride	52.9	1.4-2.4	
		Chromium	0.88	0.05	
		Iron	8.6		0.3
		Sulfate	311		250
		pH	9.08*		6.5-8.5
		TDS	1,025*		500
001	9-23-83	Fluoride	34.9	1.4-2.4	
		Chromium	0.91	0.05	
		Nitrate	13.4	10	
		Iron	2.94		0.3
		Sulfate	362		250
		pH	9.14*		6.5-8.5
		TDS	1,107*		500

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
001	6-16-83	Fluoride	34.0	1.4-2.4	
		Chromium	0.86	0.05	
		Iron	2.5		0.3
		Sulfate	334		250
		pH	9.05*		6.5-8.5
		TDS	921*		500
001	3-09-83	Fluoride	82.9	1.4-2.4	
		Chromium	0.85	0.05	
		Iron	1.62		0.3
		Sulfate	297		250
		pH	9.19*		6.5-8.5
		TDS	939*		500
001	10-07-82	Fluoride	48.4	1.4-2.4	
		Chromium	0.96	0.05	
		Iron	1.12		0.3
		Sulfate	403		250
		pH	9.13*		6.5-8.5
		TDS	1,078*		500
001	7-08-82	Fluoride	48.5	1.4-2.4	
		Chromium	0.86	0.05	
		Iron	1.08		0.3
		pH	9.10*		6.5-8.5
		TDS	921*		500
001	4-14-82	Fluoride	66.7	1.4-2.4	
		Chromium	0.84	0.05	
		Nitrate	14.6	10	
		Iron	1.70		0.3
		Sulfate	270		250
		pH	9.19*		6.5-8.5
		TDS	943*		500

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
001	2-11-82	Fluoride	44.8	1.4-2.4	
		Chromium	0.66	0.05	
		Iron	2.97		0.3
		pH	9.34*		6.5-8.5
		TDS	816*		500
001	12-07-81	Fluoride	88.0	1.4-2.4	
		Chromium	1.09	0.05	
		Iron	0.36		0.3
		Sulfate	385		250
		pH	8.9*		6.5-8.5
		TDS	1,289*		500
001	9-09-81	Fluoride	44.0	1.4-2.4	
		Chromium	1.29	0.05	
		Nitrate	15.6	10	
		Iron	2.24		0.3
		Sulfate	389		250
		pH	8.9		6.5-8.5

* - Value represents average of four replicate samples.
PDWS - Primary Drinking Water Standard
SDWS - Secondary Drinking Water Standard

All analyses presented in this summary were conducted by NGK Metals Corporation (formerly Cabot Berylco Division of Cabot Corporation).

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
002	6-16-83	Fluoride	19.0	1.4-2.4	
		Chromium	5.04	0.05	
		Iron	130		0.3
		TDS	792*		500
002	3-09-83	Fluoride	68.0	1.4-2.4	
		Chromium	1.88	0.05	
		Iron	58.5		0.3
		Sulfate	284		250
		TDS	1,017*		500
002	10-07-82	Fluoride	40.9	1.4-2.4	
		Chromium	2.04	0.05	
		Iron	74.5		0.3
		Sulfate	339		250
		TDS	1,037*		500
002	7-08-82	Fluoride	38.0	1.4-2.4	
		Chromium	4.31	0.05	
		Iron	133.5		0.3
		Manganese	1.68		0.05
		TDS	850*		500
002	4-14-82	Fluoride	63.7	1.4-2.4	
		Chromium	1.84	0.05	
		Nitrate	17.8	10	
		Iron	56.5		0.3
		Sulfate	318		250
		TDS	1,106*		500
		Manganese	0.86		0.05
002	2-11-82	Fluoride	57.7	1.4-2.4	
		Chromium	1.79	0.05	
		Iron	47.5		0.3
		Sulfate	281		250
		TDS	1,047*		500
		Manganese	0.075		0.05

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
002	12-07-81	Fluoride	55.0	1.4-2.4	
		Chromium	2.84	0.05	
		Iron	75.0		0.3
		Sulfate	313		250
		TDS	1,086*		500
		Manganese	1.10		0.05
002	9-09-81	Fluoride	42.0	1.4-2.4	
		Chromium	1.45	0.05	
		Iron	19.0		0.3
		Manganese	0.38		0.05

* - Value represents average of four replicate samples
PDWS - Primary Drinking Water Standard
SDWS - Secondary Drinking Water Standard

All analyses presented in this summary were conducted by NGK Metals Corporation (formerly Cabot Berylco Division of Cabot Corporation).

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
003	9-13-84	Fluoride	13.0	1.4-2.4	
		Chromium	0.91	0.05	
		Iron	4.36		0.3
		Sulfate	276		250
		Nitrate	11.4	10	
		TDS	839*		500
		Manganese	0.18		0.05
003	6-21-84	Fluoride	13.9	1.4-2.4	
		Chromium	0.81	0.05	
		Iron	5.56		0.3
		TDS	724*		500
		Manganese	0.18		0.05
003	3-27-84	Fluoride	18.5	1.4-2.4	
		Chromium	0.80	0.05	
		Iron	10.3		0.3
		TDS	735*		500
		Manganese	0.36		0.05
003	12-01-83	Fluoride	18.8	1.4-2.4	
		Chromium	1.04	0.05	
		Iron	6.64		0.3
		TDS	736*		500
		Manganese	0.08		0.05
003	9-23-83	Fluoride	20.1	1.4-2.4	
		Chromium	1.12	0.05	
		Nitrate	15.4	10	
		Iron	9.74		0.3
		Sulfate	331		250
		TDS	928*		500
		Manganese	0.82		0.05
003	6-16-83	Fluoride	15.0	1.4-2.4	
		Chromium	0.95	0.05	
		Iron	5.82		0.3
		pH	8.53*		6.5-8.5
		TDS	778*		500

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
003	3-09-83	Fluoride	26.5	1.4-2.4	
		Chromium	1.53	0.05	
		Iron	4.64		0.3
		Sulfate	282		250
		TDS	795*		500
003	10-07-82	Fluoride	25.3	1.4-2.4	
		Chromium	1.48	0.05	
		Iron	22.5		0.3
		Sulfate	353		250
		TDS	1,016*		500
003	7-08-82	Fluoride	22.4	1.4-2.4	
		Chromium	1.08	0.05	
		Nitrate	13.2	10	
		Iron	8.38		0.3
		TDS	710*		500
		Manganese	0.18		0.05
003	4-14-82	Fluoride	29.2	1.4-2.4	
		Chromium	1.66	0.05	
		Nitrate	16.5	10	
		Iron	15.5		0.3
		Sulfate	264		250
		TDS	782*		500
		Manganese	0.20		0.05
003	2-11-82	Fluoride	28.4	1.4-2.4	
		Chromium	1.66	0.05	
		Nitrate	17.6	10	
		Iron	26.5		0.3
		Sulfate	317		250
		TDS	829*		500
		Manganese	0.068		0.05

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
003	12-07-81	Fluoride	34.5	1.4-2.4	
		Chromium	1.99	0.05	
		Nitrate	13.4	10	
		Iron	10.5		0.3
		Sulfate	339		250
		TDS	945*		500
		Manganese	0.10		0.05
003	9-09-81	Fluoride	33.0	1.4-2.4	
		Chromium	2.49	0.05	
		Iron	21.3		
		Sulfate	353		250
		Manganese	0.1		0.05

* - Value represents average of four replicate samples
PDWS - Primary Drinking Water Standard
SDWS - Secondary Drinking Water Standard

All analyses presented in this summary were conducted by NGK Metals Corporation (formerly Cabot Berylco Division of Cabot Corporation).

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
004	9-13-84	Fluoride	40.1	1.4-2.4	
		Chromium	0.57	0.05	
		Iron	11.0		0.3
		Sulfate	379		250
		pH	9.17*		6.5-8.5
		TDS	1,045*		500
		Manganese	0.1		0.05
004	6-21-84	Fluoride	42.5	1.4-2.4	
		Chromium	0.35	0.05	
		Iron	6.94		0.3
		Sulfate	356		250
		pH	9.25*		6.5-8.5
		TDS	991*		500
		Manganese	0.1		0.05
004	3-27-84	Fluoride	58.4	1.4-2.4	
		Chromium	0.53	0.05	
		Iron	11.0		0.3
		Sulfate	348		250
		pH	9.13*		6.5-8.5
		TDS	1,008*		500
		Manganese	0.3		0.05
004	12-01-83	Fluoride	51.3	1.4-2.4	
		Chromium	0.64	0.05	
		Iron	8.76		0.3
		pH	9.10*		6.5-8.5
		TDS	1,064		500
		Manganese	0.26		0.05
004	9-23-83	Fluoride	34.7	1.4-2.4	
		Chromium	6.64	0.05	
		Iron	413		0.3
		Sulfate	386		250
		pH	8.99*		6.5-8.5
		TDS	1,075*		500
		Manganese	28.0		0.05

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
004	6-16-83	Fluoride	25.0	1.4-2.4	
		Chromium	0.94	0.05	
		Iron	65.5		0.3
		Sulfate	373		250
		pH	9.36*		6.5-8.5
		TDS	1,002*		500
004	3-09-84	Fluoride	80.9	1.4-2.4	
		Chromium	1.16	0.05	
		Iron	111.0		0.3
		Sulfate	384		250
		pH	9.24*		6.5-8.5
		TDS	1,059*		500
004	10-07-82	Fluoride	50.5	1.4-2.4	
		Chromium	3.86	0.05	
		Iron	93.5		0.3
		Sulfate	390		250
		pH	9.17*		6.5-8.5
		TDS	1,038*		500
004	7-08-82	Fluoride	33.6	1.4-2.4	
		Chromium	2.74	0.05	
		Iron	81.5		0.3
		pH	9.24*		6.5-8.5
		TDS	943		500
		Manganese	4.04		0.05
004	4-14-82	Fluoride	81.5	1.4-2.4	
		Chromium	1.56	0.05	
		Nitrate	11.2	10	
		Iron	101.0		0.3
		Sulfate	392		250
		pH	9.15*		6.5-8.5
		TDS	1,096*		500
		Manganese	5.16		0.05

SUMMARY OF GROUNDWATER ANALYTICAL DATA
NGK METALS CORPORATION, READING, PENNSYLVANIA
(Continued)

Monitor Well Location	Date Sample Collected	Parameter	Value (Mg/l)	PDWS (Mg/l)	SDWS (Mg/l)
004	2-11-82	Fluoride	68.4	1.4-2.4	
		Chromium	1.23	0.05	
		Nitrate	14.8	10	
		Iron	117.5		0.3
		Sulfate	381		250
		pH	9.32		6.5-8.5
		TDS	1,036		500
		Manganese	6.50		0.05
004	12-07-81	Fluoride	72.0	1.4-2.4	
		Chromium	0.88	0.05	
		Nitrate	10.8	10	
		Iron	189.0		0.3
		Sulfate	396		250
		pH	9.5		6.5-8.5
		TDS	1,182		500
		Manganese	11.5		0.05
004	9-09-81	DATA MISSING			

* - Value represents average of four replicate samples
PDWS - Primary Drinking Water Standard
SDWS - Secondary Drinking Water Standard

All analyses presented in this summary were conducted by NGK Metals Corporation (formerly Cabot Berylco Division of Cabot Corporation).

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CDM Federal Programs Corporation

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